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DEVELOPMENT" PROGRAMME

POVERTY ALLEVIATION THROUGH SUSTAINABLE DEVELOPMENT OF LOCAL COMMUNITIES

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LIST OF ABBREVIATIONS

AC	Administrative Code
ADB	Asian Development Bank
APR JK KR	Assembly of People's Representatives of the Jogorku Kenesh of the Kyrgyz Republic
CBD	Convention on Biological Diversity
CDM	Clean Development Mechanism
CDS	Country Development Strategy
CIDA	Canadian International Development Agency
CIS	Commonwealth of Independent States
DFID	Department for International Development of the UK Goverment
EDS	Environment Development Strategy
FCCC	Framework Convention on Climate Change
FGD	Focus Group Discussions
GDP	Gross Domestic Product
GEC	Global Environmental Conventions
GEF	Global Environment Facility
Gosregistr	State Agency for the Registration of Rights to Immovable Property under the Government of the Kyrgyz Republic
Giprozem	Kyrgyz State Project Institute on Land Management kyrgyzgiprozem
GHG	Greenhouse gases
GTZ	German Society for Technical Cooperation
IFC	International Financial Corporation
IO	Internal Organs
JK KR	Jogorku Kenesh (Parliament) of the Kyrgyz Republic
KR	Kyrgyz Republic
LA JK KR	Legislative Assembly of the Jogorku Kenesh of the Kyrgyz Republic
LSG	Local Self Governcance Bodiess
MAWMPI	Ministry of Agriculture, Water Management and Processing Industry
MFA	Ministry of Foreign Affairs
MHPU	Micro hydro power unit
MTB	Material and Technical Base
NFP	National Framework Programme
NGO	Non-governmental organization
OECD	
REPF/LEPF	Republican and Local Environment Protection Funds
RO	Responsible Officials

SAEPF	State Agency for Environment al Protection and Forestry
SEA	Strategic Environmental Assessment
SIDA	
SPNA	Specially Protected Natural Areas
UN	United Nations
UNDP	United Nations Development Programma
UNEP	United Nations Environment Programma
USA	United States of America
USAID	United States Agency for International Development
WB	World Bank

FOREWORD

The surveys conducted under the United Nations Development Programme (UNDP) Capacity Building and Environmental Governance Strengthening for Sustainable Development Project from 2005 to 2007 served as the basis for this publication. The surveys were commissioned to identify the principal needs and problems for further project proposals to be applied for to the Global Environment Facility (GEF) and other donor communities. The results of the surveys and opinions of the respondents appeared to be true, therefore we came up with the idea to publish their results to give interested parties that might contribute to initiatives implemented to promote environmental protection and sustainable development issues[1], a broad insight.

The real benefit of this publication is that it is aimed at those who are interested in special knowledge and information "straight from the horse's mouth" and gives the real picture of the current state of administrative bodies in the surveyed areas and considers the opinions of men and women willing to be involved in the rational use of natural resources and their conservation for future generations. It is intended for a wide group of environmental protection and sustainable development enthusiasts and experts who have developed new projects and programmes in the field of climate change, biological diversity conservation and the introduction of renewable sources of energy and energy efficiency.

Biodiversity conservation is a state environmental sustainability policy, the Decree of the President of the Kyrgyz Republic (KR) "On measures to preserve and increase fishery stocks in the Issyk-Kul, Son-Kul lakes and other water basins of the Kyrgyz Republic" issued January 2008 indicates this. So as part of the project a sociological analysis of the reasons for the reduction in endemic fish species in Issyk-Kul Lake was carried out, which gives information on the socio-economic state of families involved in the fishing industry, their dependence on the fishing industry, expected reaction to a new fishing regime and the population's interest in alternative sources of income. The survey results reflect the sincerity and concern of respondents regarding the fishing industry and serve as a good background for developing a new project proposal of the UNDP/GEF on Strengthening the policy and regulatory framework for mainstreaming biodiversity in the fishing industry of the KR Project that is being considered by the GEF Secretariat.

To build capacity in and increase awareness of the biodiversity of the republic there is significant information on the problems and needs of the Specially Protected Natural Areas (or SPNA). This survey revealed the real problems of poverty alleviation in SPNA buffer areas, the need to optimise their management and assess and reconsider their effective funding and use of special funds and overcoming corruption. The evaluation made by experts about the level and state of equipment, human resources and corruption enabled serious recommendations to be made about reforming SPNA activities.

Results of the social survey on Issyk-Kul Lake's adaptation to climate change form the basis for the future UNDP/GEF Building Capacity to Adapt to Coping with the Shrinking of Glaciers by Improving Rural Water Management in the Issyk-Kul Region of Kyrgyzstan Project. The project will greatly help the country's efforts to develop measures to adapt to climate change[2]. It will set out a set of measures to improve the management of climate change risks, water resources and agriculture posed by glaciers melting in Issyk-Kul province. Other challenges, including issues on meeting Kyrgyzstan's obligations under the Kyoto Protocol will be considered during the project's implementation.

Information about the socio-economic state of families of the Suusamyr Valley and their expected reaction to the introduction of a pastures management regime will provide answers to the questions of regenerating pastures and possibilities for using alternative income sources. The collected data

1 Kyrgyzstan: Environment and Natural Resources for Sustainable Development. Bishkek, 2007; Joint Country Support Strategy, 2007; Country Development Strategy till 2010 where Providing Environmental Security is one of the country's priorities
2 Human Development Report 2007/2008, Fighting Climate Change: Human solidarity in a divided world. UNDP, 2007

has enabled the new UNDP/GEF Demonstrating Sustainable Mountain Pasture Management in the Susamyr Valley, Kyrgyzstan Project to begin and drafting of the Law On Pastures and promote the joint development of a Regulation On Pasture Committees with the Department for Pasture Management under the Ministry of Agriculture, Water Resources and Processing Industry of the KR and the CAMP Ala-Too NGO. The information also made it possible to study issues of the state and use of pastures through the prism of poverty level, incomes and standard of living of the local population.

The use of alternative energy sources (AES) in the different branches of industry is directly related to the analyzed issues. This promising direction for Kyrgyzstan could be used to change over to energy efficient and resource-saving technologies in the energy supply, industrial, agricultural and housing sectors, therefore the main idea of the survey was to collect and analyze information on AES development in rural areas (sociological survey), the results of which made data on the state of and need for AES available at national level. It has been proved that the market for and production of equipment is dormant and there is not enough demand for or awareness of the equipment by the population and lack of purchasing power to implement these technologies.

The country does not have a marketing strategy to promote AES and there are no manufacturers of this equipment although biogas technologies and micro hydropower units could be produced mainly thanks to international organizations and projects .

On the other hand, the survey identified a desire by most survey respondents to save money, improve their own way of life and increase their incomes by using these energy sources. Respondents thought bio-energy, small rivers and solar energy were the most promising for rural areas. These results could be used when elaborating state development strategies and energy, agriculture and land degradation programmes and in developing the effective use of external aid in this direction.

The results of a household survey on the energy efficiency of heating and energy saving of buildings were particularly interesting. This problem is becoming more significant and relevant for Kyrgyzstan but there is not yet a priority state policy and evaluation of the problem is at the initial stage and is being implemented by several international projects and programmes that are taking into account the need to increase the efficiency of heating buildings due to price increases and their influence on the living standards of the population. The survey experts interviewed urban and rural citizens and representatives of state, municipal and private organizations as to their readiness to use AES. The opinions received led to the conclusion that there is a need to improve the legislation in this field, fight corruption, get state and municipal agencies to promote rational use of energy resources and raise people's awareness about energy sector issues to overcome the population's lack of understanding of these issues, particularly among government officials.

Results of the social survey under the UNDP/GEF Capacity building for improving national funding for global environmental management in Kyrgyzstan Project showed there should be a qualitative needs assessment to build capacity for national funding for Global Environmental Conventions through questioning the population, decision makers and representatives of the private sector. The experts identified that together with management reforms when implementing and financing the three environmental conventions, first of all it is necessary to involve the community and mass media in implementing conventions (decision making, control, assessment, expertise, etc.); in enhancing the interest of those involved in implementing them by delegating decision making, planning, implementation, responsibility and funding allocation functions to lower levels; in developing an effective coordination mechanism for implementing conventions; in determining the participants in the conventions implementation process and their functions (horizontal and vertical management); in developing successful criteria for each participant's function; in developing a detailed mechanism of responsibilities of each participant for failure or unsuccessful implementation of his functions; in providing effective and transparent reporting on

conventions' implementation; in providing government human resources selection support to participate in the conventions' implementation process; in involving NGOs and civil society; in monitoring and exposing in the mass media violations and court cases brought by environmental inspectorates.

Taking into account that a new Jogorku Kenesh (Parliament) and Government of the Kyrgyz Republic have been formed, these surveys could prove invaluable for those interested in promoting the issues considered at the decision making level and in mobilising external and internal resources and their effective and rational use and for those interested in improving the national legislation and the implementation of international obligations of the KR in environmental security, achieving the Millennium Development Goals (MDG) and the Country Development Strategy till 2010.

Almost all the surveys related to management issues identified the serious problems local authorities have with limited financial and organizational resources to implement their activities. Results showed that local planning aimed at mobilising funding, improving environmental management and capacity building in this area and providing services mainly in pasture, land, water, forest and energy use are insufficient. Efforts of local self-governance bodies on the above-mentioned issues are not included in local socio-economic plans and so their activities cannot be monitored and evaluated. Often the weak effectiveness of their activity results from corruption in higher and local controlling bodies.

This publication will serve as a good basis for developing a new environmentally balanced policy and deepen cross-sectoral partnership between the government, business and NGOs. This will undoubtedly interest the donor community as environmental and sustainable development issues in the surveyed areas and opinions of further beneficiaries mainly at local level have not been studied and are crucial for developing and initiating new environmental projects and programmes and promoting environmental elements of external aid.

We hope this publication will increase the awareness of all stakeholders and help build partnerships that will bring positive changes to the present and future of the country.

ACKNOWLEDGEMENTS

This report could not have been prepared without the generous contribution of the professionals of state and international organisations and the scientific community. We would like to thank the El-Pikir Centre for Public Opinion Research NGO that conducted the surveys and interviews with experts, the population, representatives of the private sector and state institutions in the areas of alternative energy sources, fish species conservation, pastures, climate change, specially protected natural areas etc.
El-Pikir has acknowledged international expertise in analysis and research and is working in five CIS countries – Kyrgyzstan, Kazakhstan, Tajikistan, Azerbaijan, and Russia. During the surveys of organizational experience, the ideas and knowledge of the UNDP Capacity Building and Environmental Governance for Sustainable Development Project's experts and staff were used.

The authors would also like to thank the representatives of state institutions at central and local levels and stakeholders from international and non-governmental organizations in Kyrgyzstan for their interest, information, reports and other material and general support in conducting the surveys. Special thanks go to:

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- B. Lipkin – Head of the Hydro-electricity Laboratory, National Academy of Sciences of the KR.

We would also like to thank all of those involved in preparing this publication:

- Citizens of Bishkek and SPNA buffer zones, Issyk-Kul oblast and the Suusamyr Valley and representatives of business structures, international and non-governmental organizations whose opinions are summarized herein
- Representatives of ayil okmotu, state and municipal bodies for their sincere and professional responses and active participation in discussions and developing recommendations.

CAPACITY BUILDING FOR NATIONAL FUNDING OF GLOBAL ENVIRONMENTAL CONVENTIONS

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INTRODUCTION

The objective of this survey was to obtain information on the problems and ways of increasing funding to meet obligations under global environmental conventions (GES).

According to the preliminary specifications, the study was carried out based on three global environmental conventions:

- The UN Convention on Biological Diversity
- Convention to Combat Desertification in Those Countries Experiencing Serious Drought, Particularly in Africa
- The UN Framework Convention on Climate Change.

The study did not aim to analyse problems of meeting and funding the obligations under each convention separately.

1. METHODOLOGY

The survey was aimed at making a qualitative assessment of the requirements for enhancing the national capacity to finance obligations under GEC through an analysis and interviews with decision makers and representatives of private companies and the public at large.

The survey had the following objectives:

- Identify the main problems and prospects for meeting the obligations undertaken by Kyrgyzstan under GEC;
- Study the views of government officials and private and non-governmental sector representatives on how to improve budget and extra-budget funding of Kyrgyzstan's obligations under GEC.
- Assess the capacity and prospects of fiscal and market stimulation of the private sector to participate in environmental activities, rational use of natural resources and promoting clean technologies and industries.

Target groups:

- Experts – state officials from key government institutions, members of parliament, owners and representatives of private businesses and organizations and professionals from international projects,
- Residents living near selected target areas (problem areas from the viewpoint of implementing GEC).

Survey areas

It should be noted that the analysis was mainly aimed at studying the views of specialists and decision-makers involved in problems of funding the obligations under the three conventions, therefore, the interviewers worked mainly in Bishkek.

Eight special survey areas were also selected at a working meeting in order to see the current problems of funding GEC obligations. The criteria for selecting target areas were environmental problems related to the below-mentioned resources.

Table 1.1. Survey areas

	Survey Location	Problem (probable)
1.	Arkid	Reserve
2.	Suusamyr	Pastures
3.	Ekinaryn	Hunting grounds
4.	Bishkek	Atmosphere
5.	Kara-Syy, Osh province	Water, waste
6.	Nizhne-Chyisk village	Water
7.	Karakol	Fish
8.	Sosnovka	Various

Data Collection and Sampling Methodology

- Focus group discussions (FGD) with local residents involved in environmental conservation activities and directly exploiting natural resources, on ways to improve the funding of environmental protection activities and possibilities for stimulating it fiscally and marketing it.
- Expert questioning (in-depth interviews) – with state officials from key government agencies, members of parliament, owners and representatives of private businesses and organizations and experts from international projects.

Due to the lack of experts during the summer holidays, with the consent of the Client, it was decided not to carry out FGD with experts. Taking into consideration that open discussions with representatives of agencies with, in certain cases conflicting interests, are not productive it was decided to conduct in-depth interviews, as a way of gathering fuller information about the problems of any particular agency and contradictions existing between the agencies.

Tools

During meetings with stakeholders it was decided to develop and use the following questionnaires:

- Guide for public focus group discussions
- Questionnaire for weakly structured interviews with experts.

2. CONVENTION OBLIGATIONS OF THE KYRGYZ REPUBLIC

Kyrgyzstan is a party to the eleven international conventions and three protocols listed below (Table 2.1.) under which the country has undertaken certain obligations in the field of environmental protection.

Table 2.1. International Environmental Conventions and Protocols signed by Kyrgyzstan

Title	Date of Joining/Ratification	Responsible Agency
UN Framework Convention on Climate Change	Law №11 on Accession dated 14 January 2000	SAEPF
Kyoto Protocol to the UN Framework Convention on Climate Change	Law №9 on Ratification dated 15 January 2003	SAEPF
UN Convention on Biological Diversity	Law № 40 on Accession dated 26 July 1996	SAEPF
Protocol on ratification of the Cartagena Protocol on biological safety and the UN Convention on biological diversity	Law №140 On Accession to the Cartagena Bio-safety Protocol and the UN Convention on Biological Diversity dated 06 August 2005	SAEPF
Convention on Long-Range Transboundary Air Pollution	Law on №11 Accession dated 14 January 2000	SAEPF
Vienna Convention for the Protection of the Ozone Layer	Law №16 on Ratification dated 15 January 2000	SAEPF
Montreal Protocol on Substances that Deplete the Ozone Layer		
Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	Law №15 on Ratification dated 15 January 2000	SAEPF
Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal	Decree № 225-1 of the APR JK KR on Ratification dated 30 November 1995; Decree № 304-1 of the LA JK KR on Accession dated 18 January 1996	SAEPF
Convention on Environmental Impact Assessment in a Trans-boundary Context (Espoo)	Law №6 on Accession dated 12 January 2001	SAEPF
Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (Aarhus)	Law №5 on Accession dated 12 January 2001	SAEPF
UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought, Particularly in Africa	Law №85 on Accession dated 21 July 1999	MAWRPI
Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat	Law №54 on Accession dated 10 April 2002	SAEPF
Stockholm Convention on Persistent Organic Pollutants	Law №114 on Ratification of the Stockholm Convention dated 19 July 2006	SAEPF

According to the definition used by the Global Environment Facility and its agencies such as the UNEP, WB, and the UNDP, all conventions adopted under the auspices of the UN aimed at solving global environmental problems are classified as global environmental conventions .

Three of them, the UN Framework Convention on Climate Change and the UN Convention on Biological Diversity and the UN Convention to Combat Desertification in Those Countries Experiencing Serious Drought, Particularly in Africa initiated by and approved by most of the country – participants of the Earth Summit – the UN Conference on Environmental Development in Rio-de-Janeiro in 1992, were subsequently signed by Kyrgyzstan.

In general world practice, signing global environmental conventions is an accession to a common international process aimed at solving global environmental problems and changing over to the sustainable development of society. This process is participated in by both developed, wealthy states and poor, developing countries. Wealthy states can themselves rearrange the development process considering environmental sustainability and developed countries help developing countries solve the most acute development problems (poverty, mass diseases and improved development conditions by enhancing legal frameworks, institutions and management systems and introducing better practices) on the way to achieving the main conditions for sustainable development. They also help finance added value in promoting environmental sustainability, if the developing countries themselves create the necessary conditions for such development.

Membership of these conventions has given Kyrgyzstan access to resources through which certain objectives aimed at improving natural resources management can be met within the aspects considered by the conventions. At the same time, membership of conventions places upon the country considerable obligations, whilst the value of possible aid accessible as a result of signing up to conventions is not sufficient to allow the country to solve the problems in those specific fields and subsequently to meet those obligations.

The general requirements for all three conventions include:
- Existence of an authorized government agency;
- Developing and adopting national strategies and action plans to meet the obligations undertaken under the conventions;
- Submitting national reports on the implementation of conventions' obligations to the appropriate secretariats.

There are no specific narrow obligations for each country under the conventions, but there are classifications for countries according to different limits and criteria. The Kyoto Protocol, for example, introduced into the UN Framework Convention on Climate Change a system of quotas and compensations for discharging carbon into the atmosphere, which caused the USA to refuse to sign it. The USA is the biggest producer of greenhouse gases into the atmosphere. Kyrgyzstan, in its turn, does not reach the minimum discharge ceiling (30 tons per year), which makes it unattractive for potential investors to implement projects related to reducing discharges and various compensation measures, related to these mechanisms.

The Global Environment Facility's resources are available to fulfill the obligations undertaken under these conventions. The projects in Kyrgyzstan are mainly implemented through key GEF execution agencies such as the WB, UNEP, UNDP, ADB and others.

From 2003-2005 the UNDP/GEF National Capacity Self Assessment for Global Environmental Conventions Management project was implemented in Kyrgyzstan, with the following results:
- Subject Review on Global Environmental Conventions: Capacities of Kyrgyzstan (2004)

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http://lnweb18.worldbank.org/ESSD/envext.nsf/45ByDocName/PartnersandLinksGlobalEnvironmentalConventions

- Final Report on Global Environmental Conventions: Cross-Sectoral Interaction and Capacity Building in Kyrgyzstan (2005)

The project analyzed Kyrgyzstan's fulfillment of its obligations under conventions and reflected its main achievements and problems in this process. It assessed the existing capacity building requirements, effective inter-sectoral interaction and increase in public awareness and improvements to legal frameworks.

To assess the Kyrgyz Republic's fulfillment of its convention obligations, the UNDP, at the request of the State Agency for Environmental Protection and the Forestry Service, within the Capacity Building and Environmental Governance Strengthening Programme, conducted a study which drew the following conclusions:

- Currently, Kyrgyzstan has no database on meeting environmental conventions' obligations, including GEC. The process is complicated by the frequent restructuring of the Government of the Kyrgyz Republic and confusion in executive agencies. There is a lack of exchange of information both between and within government structures responsible for meeting obligations under conventions.
- Frequent changes in national executive agencies for implementing certain conventions are not conducive to establishing sustainable dialogue with either the secretariats of conventions or potential investors. The lack of clear coordination promotes parallelism and dispersion of resources and ineffective fulfillment of obligations under any specific convention.
- There is no appropriate coordination and control over meeting international convention obligations and their protocols, either by the Ministry of Foreign Affairs, the Kyrgyz Government and/or Parliament. According to the existing legislation, coordination of obligations rests with the Ministry of Foreign Affairs and issues of control with the Government of the Kyrgyz Republic. (Law of the Kyrgyz Republic on International Agreements and the Regulations on the Ministry of Foreign Affairs). The Jogorku Kenesh (Parliament) does not use its right of control over executing the legislation in this area.
- The conventions' obligations are mainly met by international projects, the coordination of which on the part of the government, is ineffective;
- There are certain legal discrepancies in regard to the accession to, ratification, and signing of conventions. Thus, the legality of signing the Basel Convention requires clarification. It was signed by both Houses of the Parliament of the Kyrgyz Republic, but there is no law specifying accession to it signed by the President of the Kyrgyz Republic, as required by the Law of the Kyrgyz Republic on International Agreements;
- The Government Focal Point for the UN Convention on Biological Diversity is the Director of the Institute of Irrigation, which considerably lowers the status of the FP and the Convention itself;
- The absence of systematic reporting on implementing the obligations of conventions limits appropriate coordination and control over fulfillment.

To enhance coordination and control over the fulfillment of conventions and to accelerate accession to important protocols and conventions, experts suggest:

- Recommending that the Government of the KR carry out an inventory of all ratified environmental conventions and international agreements and assign appropriate focal points, to evaluate implementation measures and the process for meeting obligations over the past five years. Based on the findings of the inventory draw up recommendations to the Government of the Kyrgyz Republic, SAEPF and MFA of the KR on how to improve the coordination and control systems for GEC implementation.
- Develop and introduce a systematic record keeping and accountability format on the fulfillment of environmental conventions.
- Clarify and regulate issues and mechanisms of implementing agencies for each convention, including legal frameworks.
- Determine the status of centres established under the implementation framework for each Convention,

their functions, responsibilities and partnership with the Government.

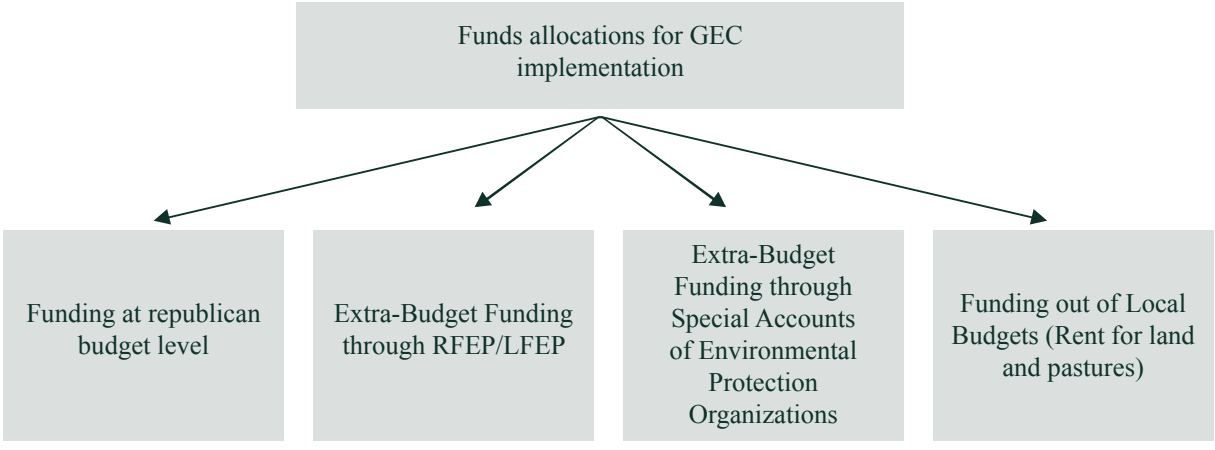
- Enhance the work on synergies of meeting obligations under conventions within the framework of inter-institutional and cross-sectoral interaction.
- Solve the issue of payment of fees due under conventions (The Decree on Fulfilling the Social and Economic Development Plan for 2005 and 2006 (Decree No.169 of the Government of the KR dated 16 March 2006) indicates that the KR owes international fees, including those due under international conventions, of one billion Kyrgyz Soms).
- Develop a Guide to Implementing the Strategic Environmental Assessment (SEA) tool for strategic planning at central and local levels of decision making with the support of international organizations and projects.
- Develop a control mechanism for the effective use of donors' aid aimed at meeting obligations under GEC.
- Consider synergies in all environmental conventions and use them when implementing long-term Country Development Strategies.

Take into account that the recommendations have to produce the most effective fulfillment by Kyrgyzstan of its obligations under environmental conventions and enhance the possibilities of getting benefits from its membership of environmental conventions. The benefits of attracting resources are described later.

3. III. FUNDING MEASURES FOR MEETING OBLIGATIONS UNDER GLOBAL ENVIRONMENTAL CONVENTIONS

In accordance with the existing legislation, national funding for GEC is taken from the national budget, republican and local funds for environmental protection (RFEP/LFEP) through taxes on land and pastures and extra-budget funding of the Forestry Service and Specially Protected Natural Areas.

Figure 3.1. Funding for GEC

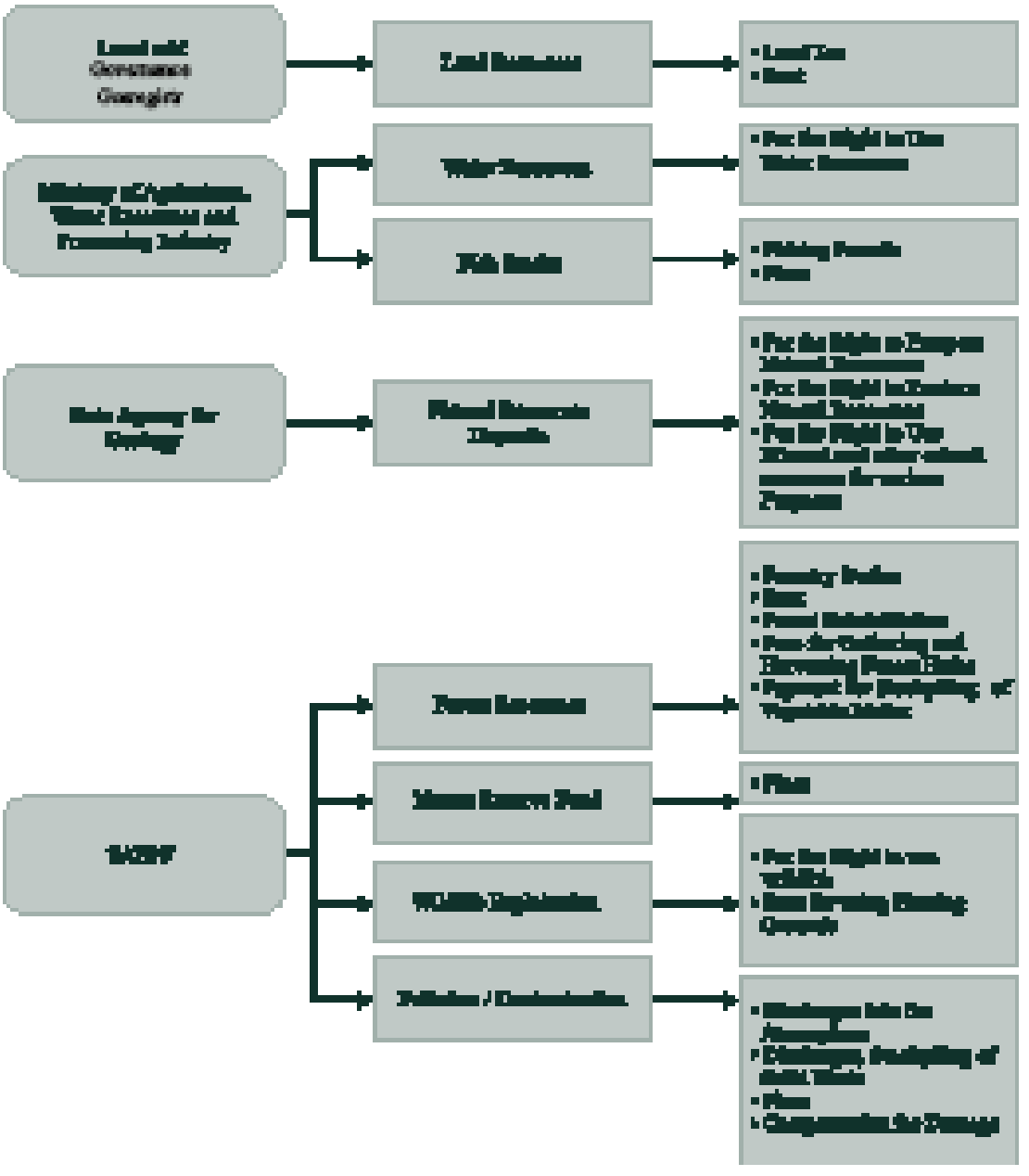


As revealed by the analysis, the resources for funding GEC are generated through two types of fees for using natural resources: for the right to use natural resources and for environmental pollution.

In accordance with the existing normative and legal framework, the payments are collected by local government structures, Gosregistr, Ministry of Agriculture and Water Resources and Processing Industry, State Agency for Environmental Protection and Forestry and the State Geological Agency (Figure 3.2.). In accordance with the legislation of the Kyrgyz Republic, the collected fees are transferred to the republican and local budgets and environmental protection funds.

National currency of the Kyrkyz Republik.

Figure 3.2. Payments for natural resources



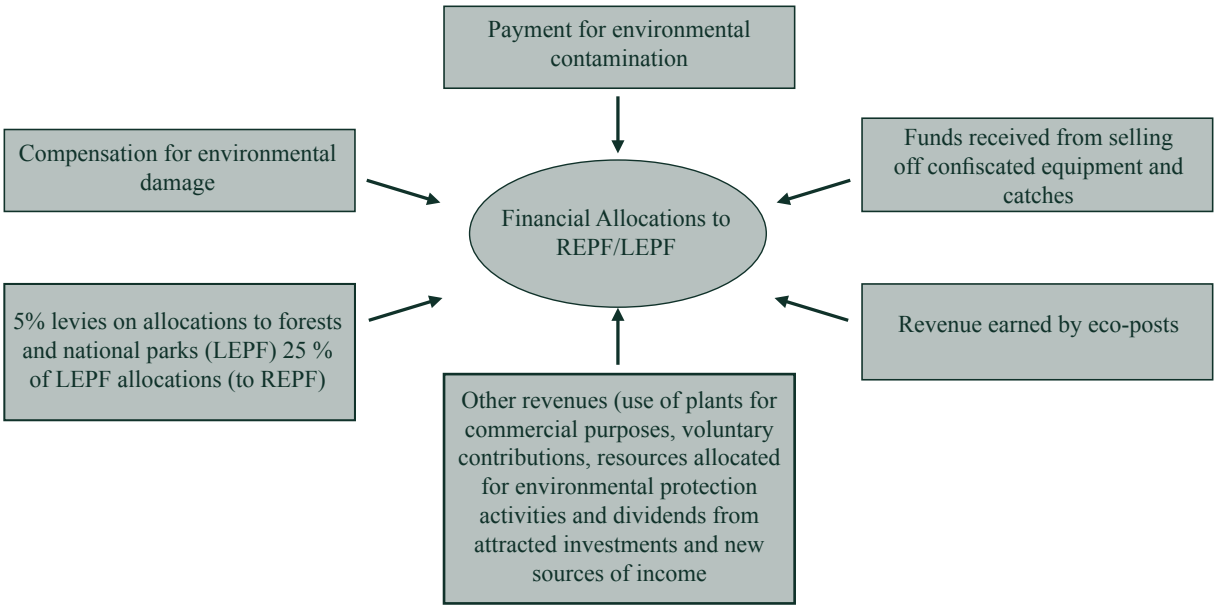
Financial resources transferred to the central budget are then re-distributed in accordance with its expenditure items.

Currently expenditures on environmental protection account for 0.02% of GDP, which means that only protected expenditure items of environmental institutions are financed at national level (wages and social fund payments) and GEC obligations are not financed from the central budget.

Notably, the overwhelming majority of experts considers it necessary to increase the level of national funding of GEC obligations from the central budget and propose establishing targeted items for environmental activities in the expenditure part of the republican budget. The introduction of this measure, according to experts, would improve funding of the GEC and confirm the priority of meeting the international obligations assumed by the Kyrgyz Republic and increased national funding opens the way to attract more international resources

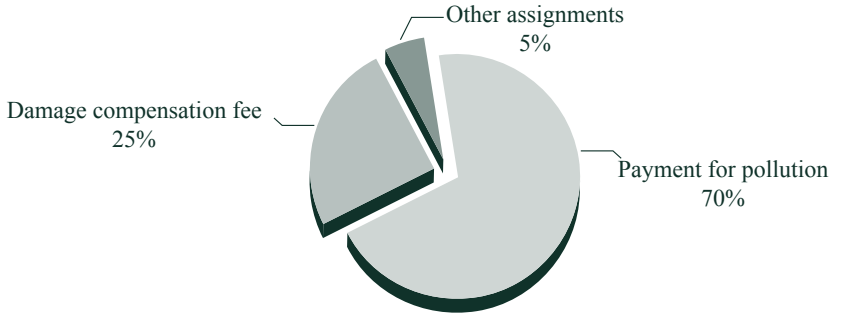
In accordance with the environment legislature the GEC obligations are financed through environmental protection funds.

Figure 3.3. Financial receipts to REPF/LEPF



The following structure of financial allocations was developed based on interviews with representatives of the environmental protection funds, (Figure 3.3.).

Figure 3.4. Structure of financial revenues of REPF/LEPF



Comparing figures 3.3 and 3.4 shows a considerable shift in the structure of funding towards fees for contamination, which according to some experts accounts for up to 70 per cent of total revenue. The second largest source of funding by value is compensation fees, which make up around one quarter of all revenue, whilst all other funding sources account for not more than 5%.

Thus, analysis of the existing structure of revenue shows that increased national funding of the GEC should initially be aimed at optimising the main gains and seeking and expanding new sources of funding.

Let us consider the main sources of financial allocations in more detail

Contamination and damages

A survey of businesses paying regular environmental contamination fees revealed a number of serious problems in the existing practice of calculating and levying these payments. According to business owners the existing instructions and methodological guides on procedures regarding the levying of payments for contamination and damages are cumbersome, obscure and tangled. Moreover, the existing subordinate legal acts contain dubious norms that give inspectors considerable freedom when determining the level of fees, which creates fertile ground for bribery and corruption by inspectors and businesses and according to many businesses this leads not only to lower revenues, but also to deterioration of the environment.

Look at Resolution 2 #107 on fees for contamination. I have two university diplomas and still cannot calculate how much I should pay from a filling station with five petrol pumps, so do you think that other business owners, especially small and medium businesses can calculate this? When an inspector comes he asks for an amount, which makes me clutch my head, so we all have to look for loopholes, pay inspectors and become sponsors in order to pay lower fees

Expert, Bishkek

Meetings with representatives of the private sector revealed that the practice of extorting sponsorship by inspectors from businesses through pressure for obtaining permits (discharge, damage) is quite widespread and the survey revealed there is organised corruption within the system of processing and approving ecological passports. Thus, special "pocket or controlled"[3] organizations are set up and only those eco-posts controlled by the "proper" organizations are approved. Business owners still do not understand the tariffs for processing and approving eco-passports.

Inspectors have registered cases where businesses paid fees to the environmental protection fund in kind (petrol, vodka etc.), which is not legal on the one hand and on the other, diverts resources from the fund.

The survey revealed that similar trends can be seen in regard to calculating and levying payments for excess discharges and compensation. Survey respondents spoke of numerous cases when they had to

[3] Here and further in the text participants are quoted with minimal editing

[2] Resolution № 107 dated 17 February 2006, «On insert of remarks and additions to the Goverrnment Resolution № 823». On passage of instructive and metodical identification on payment for environment pollution in the KR» dated November 2004.

unofficially pay inspectors to reduce the amount of damage and calculate fines on minimum tariffs. According to business owners, this practice is quite widespread and definitely reduces the value of proceeds from businesses.

Resources from eco-post activities

The questioning of experts and meetings with local residents revealed that practically no ecological posts give receipts and bills, which make respondents, doubt how much of the funds raised are transferred to the appropriate accounts. According to some experts approximately half of the revenues collected by eco-posts do not reach the appropriate accounts but disappear into the pockets of area or province level officials, supervising these posts. Furthermore, there were indications that some eco-posts get phone calls or messages and do not charge relatives or acquaintances of area, province and republican level officials, or officials of the prosecutor's office, courts, Ministry of the Interior, tax and customs authorities, etc.

Another problem is transparency in spending resources collected from eco-posts. As an example, experts spoke of the situation where only a small portion of the resources collected by eco-posts are used for environmental protection purposes and given this experts believe that eco-posts do not justify their existence.

Resources from selling confiscated equipment used for illegal gains

Interviews with gamekeepers, foresters and inspectors revealed that the legislation in the field of confiscating equipment used for illegal gains is not backed up by an appropriate funding mechanism, which lessens the effectiveness of this source of funding. The confiscation of boats was given as an example that according to the law should be transported from the place of confiscation and held until the court proceedings. Notably, after confiscation the exhibits become the property of the state and the court through an officer of the court must ensure a court's verdict is enforced as soon as possible. All these procedures, based on the existing practice, are processed through departments of the Ministry of Economy and Finance and its area branches depending on their sub-departments. According to experts, this procedure is long-winded and in general experts believe that this source is not very promising in terms of increasing the national funding of the GEC.

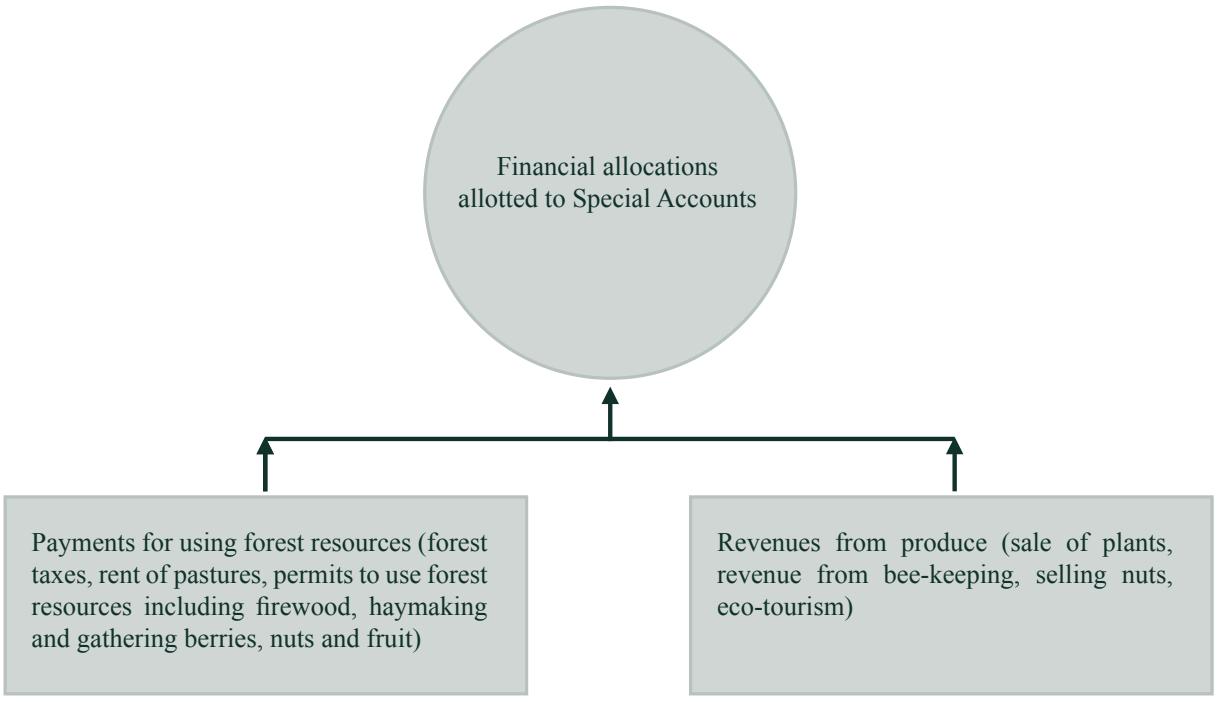
As revealed by the survey, important sources of funding such as investment are rarely practiced and tax incentives and benefits should be given to investors.

In general, evaluating the performance of the environmental protection funds in terms of fulfilling GEC, the experts note that in most cases, the resources of funds are not used for programme goals, but more frequently on one off measures and priorities for funding are not set systematically and there are cases of waste. In most cases no fulfillment indicators are applied and no analysis of the results achieved is made and there is a need for more transparency in collecting and spending the resources of the funds and some experts specify the need to abolish the existing environmental protection funds and suggest making payments directly to the central budget and financing environmental measures and programmes through designated budget items.

Funding obligations under global environment conventions through special accounts of environmental protection organizations

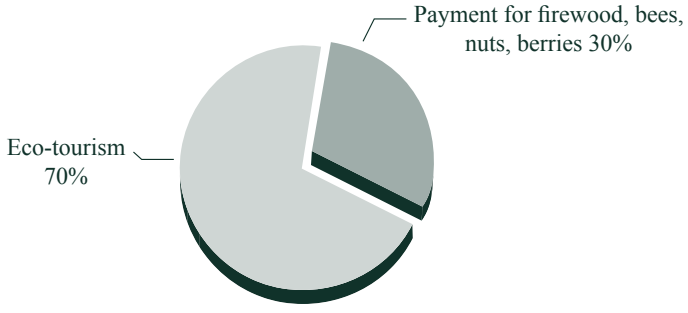
Interviews with experts showed that GEC obligations at SAEPF level are funded from special resources that are accumulated on special accounts and spent through the Treasury. Meetings with representatives of forestry and environmental protection authorities showed that there are no problems with withdrawing funds from special accounts and the holders of these accounts can easily obtain the required amounts.

Figure 3.5. Sources of Special Reserves (may be budgetary)



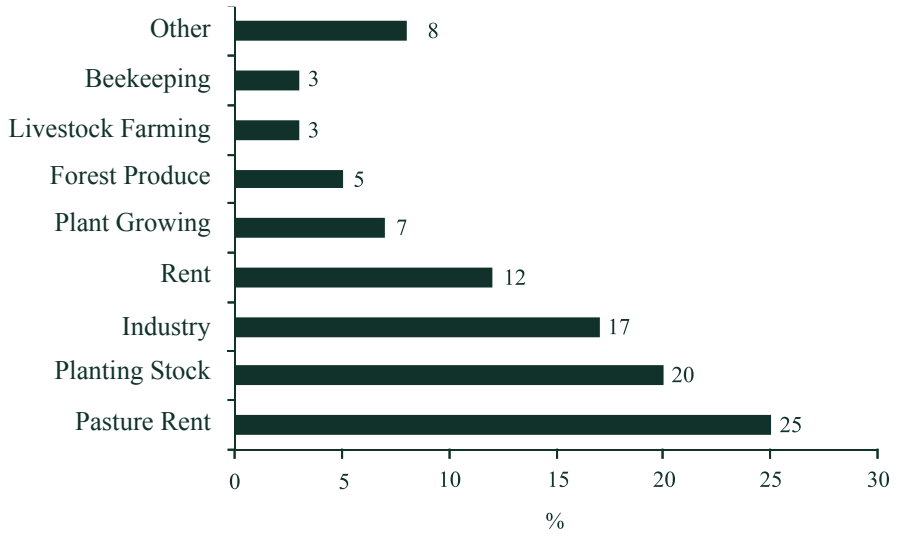
A study of the structure of special accounts revealed considerable differences between reserves, forestries and national parks in how special funds are formed. The main difference lies in the different purposes of environmental protection organizations and their legal status. Thus, reserves legally do not have the right to be involved in economic activities, therefore, the only source of their special funds is eco-tourism, which accounts for up to 70% of the total income of special reserves and the rest is made up from payments by residents of buffer zones for firewood, gathering forest produce (nuts, berries, fruit) and proceeds from beekeeping.

Figure 3.6. Structure of Nature Reserves' Special Accounts



Forests and national nature parks have a right to engage in economic activities within legal limits and accordingly have a wider spectrum for generating funds (Figure 3.7 and 3.8)

Figure 3.7. Structure of Special Accounts of Forestries



According to forest managers the development and processing of nature's bounty (nuts, apples, plums, raspberries, dog-rose, hawthorn, etc.) and the commercial drying of medicinal herbs, development of pond fisheries (in the south of the Kyrgyz Republic) for which forestries do not have financial resources, can significantly increase special account revenues. In a number of cases experts emphasized the need to expand exploitation zones, which require the rebuilding of existing roads and the construction and repair of bridges.

Emphasis was also placed on the need to develop eco-tourism, which plays a great role in generating internal revenue for reserves and national parks and so far has not benefited forests. However, the majority of survey respondents think that in the long term tourism damages natural eco-systems.

Different forums for advertising and attracting investors and tourists are certainly needed, but for our reserves, for example for Son-Kyl, they are disastrous. I remember one such forum in 2002 after which cars left tracks many kilometres long and it will take 10 years for them to grow back, therefore, we have to understand tourism's benefits.

Expert, Bishkek

Increased revenues from selling plants requires an expansion of planting areas, arranging irrigation systems and increasing the allocation of resources to acquire quality seed material.

According to some experts, the proceeds from the sale of firewood, rent for haymaking and use of pastures for livestock grazing on Forest Fund land should not be the main source of revenue, since these activities are not conducive to the natural regeneration of forestries, so this group of experts supports no further increases in these particular sources of revenue.

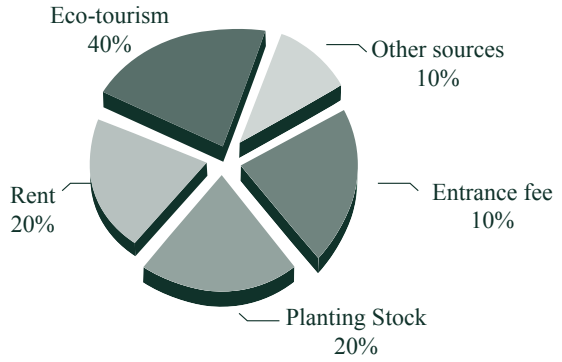
Such activities as beekeeping and livestock farming within forest areas and SPNA are restricted on the one hand by the law and on the other hand by the natural resources, therefore, according to experts, these sources of funding are not very promising.

At the same time many respondents noted the rather low (in view of the existing levels of poaching and illegal wood-cutting) revenues from fines and court cases brought by foresters/ gamekeepers. During the survey, the researchers on more than one occasion were told of cases of foresters/gamekeepers whom residents of buffer zones described as "official poachers". Numerous examples were given that after obtaining an official permit for cutting 1-2 cubic metres of firewood, 5-6 cubic metres could actually

be cut and deals can even be done for valuable timber. Based on available data, experts believe that the actual revenue of Forest Service and SPNA from the sale of timber exceed the declared figures by several times. In some cases it was indicated that daily cutting in one of the national parks until recently was over 100 cubic metres of timber per day.

Many experts believe that under the present conditions forests have practically no protective functions - their activities are mainly limited to making profits.

Figure 3.8. Structure of special funds of national nature parks



As shown by the survey, the structure of special funds of national parks is similar to the structure of forests, which means that their approaches to generating these internal resources are also similar. According to experts in many cases activities of natural parks vary very little from activities of forests.

As to payments for visits by tourists they are not registered – "occasionally some cinema tickets are given without stamps". Accordingly, this revenue item is practically uncontrolled and does not reflect the real number of tourists.

In regard to increased revenues from people (haymaking, firewood cutting) experts believe that despite the fact that tariffs are minimal, there is no need to increase them - "nothing more can be taken from the people" – they believe.

According to experts there are some specific problems with internal revenues, since not all of them are accumulated on special accounts. Respondents relate this to the fact that "at the current level of development of the regions, there are few state owned enterprises on the ground that are controlled by local officials, whereas they have to pay for visits by top officials and live themselves. The area and province authorities know that we have cash and try to pressure us into using our resources". Notably, despite SPNA not being directly dependent on local government (the appointments are made by the SAEPF), SPNA are in reality tied into their areas and local infrastructure and the reports on SPNA activities are read at area and province board meetings. As a result, practically all SPNA, especially those located near area and province centres are subjected to pressure from area/province level officials – in the form of different inspections (tax authorities, accounts audits, prosecutor's office, courts, etc). Managements of SPNA are forced to organize holidays for and host visits of these officials from their internal revenue. These improper activities of higher officials deprive employees of SAEPF of funds who in view of their low salaries, indulge in corruption. This situation, according to experts, "considerably depletes the very limited resources collected from environmental protection activities".

When celebrating the 50th anniversary of the Issyk-Kul Reserve half the drinks were supplied by GTZ and the other half (over 50,000 soms) was allocated by the Reserve. As a result the employees of the reserve were unpaid for two months. How can you not steal given that? Every annual report is accompanied by eating a horse or some other game and each visit to the Centre and each board meeting means expenses – it is very stressful. It is a heavy burden and low paid, but probably a prestigious one, since people want it and are ready to handle the problems.

Expert, Bishkek

In general, experts positively evaluate the existence of special reserves and according to them this is the "only thing that allows them to work today" and they have proposed several ways to improve the situation concerning special reserves:

- Improve the mechanism for collecting resources (introduce control-cash machines, install video cameras at posts, etc.) develop measures aimed at increasing transparency of expenditures and introduce public control over proceeds and their use.
- Prohibit the existence of special accounts at government level and transfer all revenues directly to the central budget where they should be 'ring-fenced' and used for environmental conservation purposes.
- Prohibit the existence of special accounts and transfer all resources to state environmental protection agencies that would set priorities and use the resources for environmental protection

At first glance, the concentration of resources in one agency/budget seems to be a quite justified option, however, given the existing level of corruption in the state apparatus and the system of distributing state resources, there is a danger that abolishing special accounts could do more harm than good.

Funding through local budgets

According to the existing legislation, the rent for using land resources and pastures goes into the budgets of local government bodies. For example, the revenues from renting pastures go to:

1. 90% to the relevant local budgets:

- ayil okmoty (local self-government) – for the use of adjacent pastures;
- area state administration – for the use of intensive use pastures
- province state administration – for the rent of remote pastures.

2. 10% of all revenues earned from renting out all pastures is transferred to the accounts of Gosregistr (State Immovable Property Registry) in the form of internal revenues and should be spent on land use organizational matters and should be reflected in the revenues and expenditure parts of the republican budget.

Revenues earned in the form of land tax, are legally distributed in the following way:

1. 90% of resources are transferred to village (city) councils and used for social and economic development of the village (city), of which:

- 10% goes to the agricultural producers insurance fund

2. 10% - is transferred to area budgets

Some of the funds collected from the relevant budgets must be used for land and pasture regeneration activities[4], however according to experts the repayment funding mechanisms are currently ineffective e.g. "Nothing is allocated for land or pasture regeneration from the collected funds".

In addition the imperfection of the system for collecting grazing fees, which is levied per head of livestock, was mentioned by experts who estimate that the "actual numbers of livestock are usually under-

[4] In 2007 the WB developed a Draft Law On Pastures that considers reviewing the minimum fee. Some think that fees should be collected per head of livestock whilst others per ha of pasture

stated by half or even two thirds where "the increase in livestock numbers is not in sheep but in calves, which are born in spring and after being kept for a season are slaughtered in autumn". On 1st January when registration is carried out they have not yet been born and by the end of the year they have already been killed, so it virtually impossible to check how many livestock have been grazed".

The problem of the actual number of livestock is especially important for buffer and conservation areas, where the number of livestock per household is limited by legislation. As focus group discussions among the population revealed, people often keep more livestock than officially allowed without paying fees for them, which leads to reduced fee collection and excessive grazing of pastures.

It should be noted that according to the legislation leaseholders must also carry out land and pasture regeneration activities[5] but the surveys[6] show that such activities are virtually never carried out due mainly to no motivation for leaseholders to abide by the legislation and the lack of appropriate control over it by the relevant bodies and other reasons.

What can we say, soil everywhe marshy. Collector drains and the whole drainage system, which were built during Soviet times, are obsolete and yet nothing is being done to improve the situation and unfortunately all this results in smaller areas of useful land, mosquitoes and malaria

Expert, Chui province

Summarizing the experts' opinions it can be concluded that currently no positive action is being taken to regenerate land and pastures and no funds are allocated at national level for preventive measures against desertification and swamping.

Logically, taxes collected from vehicle owners of auto transport should be spent on implementing the UNFCCC but no one knows where the money from the State Vehicle Inspectorate goes.

Expert, Bishkek

Analysis of this funding source and its allocation pattern shows that national funding of the three studied conventions is insufficient. The conventions on biodiversity, desertification and climate change are mainly funded through international projects and grants, but practically no funds are provided either from the republican budget or non-budget sources.

According to the survey this situation is explained first of all by the fact that the emissions discharged into the atmosphere by Kyrgyzstan are relatively small (compared to other countries), therefore the attitude towards FCCC within the country and in the international community is casual.

The authorities in Kyrgyzstan sign conventions just to look good in the international community and then they forget about them. The Framework Convention on Climate Change is an example of this. No one even analyses beforehand why they should be signed or how they will be implemented or if there is capacity for implementing them. In other words from the very beginning. A formal paper approach is used, which is why the implementation of conventions looks better on paper than it really is.

Expert, Bishkek

Why have you come to our ministry? The SAEPF is responsible for this convention and takes all the money from international organizations. You should interview them!

Expert, Bishkek

I will not be interviewed. Tell me what I am going to gain from this study. The money will go to the SAEPF anyway. You must pay me if you want to interview me.

Expert, Bishkek

[5] KR Government Decree No. 360 dated 4 June 2002. Land Code of the KR No. 45 dated 2 June 1999

[6] Household survey in the Suusamyr Valley. UNDP Environment for Sustainable Development Programme in the KR, El-Pikir Survey and Public Opinion Centre, Bishkek, 2005

Responsibility for implementing each convention is shared between a number of stakeholders in the government structure and more often it rests with the SAEPF, however analysis shows that almost all stakeholders except the SAEPF, do not realise the significance of joint activities and there is a lack of coordination, monitoring mechanisms and evaluation of the activities of each participant and clearly-defined responsibility indicators. Serious changes in cross-sectoral interaction are required to meet Kyrgyzstan's obligations under conventions.

4. WAYS OF BUILDING CAPACITY FOR NATIONAL FUNDING OF GLOBAL ENVIRONMENTAL CONVENTIONS

Environmental priority of the country's development

According to experts although Kyrgyzstan has signed and ratified the most significant environmental conventions, the environment is currently not a priority in the country's development[6] which is reflected in the attitude towards environmental issues in decision making at all levels of authority both vertically and horizontally and proved by funding the environment in the country on the residual principle.

Even the highest authorities give preference to projects with short-term material benefits and don't think about ten years time when the problem of clean water and air will arise, as such a policy will be thought of as harmful for Kyrgyzstan

Expert, Chui Province

In our small mountainous Kyrgyzstan development must be based only on the principles of sustainability: sustainable development of the economy, social sector and a sustainable environment

Expert, Bishkek

The priorities proposed for the country development strategy: economic (especially the mining industry), administration (governance) and social spheres raise concerns among environmental NGOs.

Ministries and agencies other than the SAEPF have no such word as environment and so they bear no responsibility for protecting the environment

Expert, Bishkek

The survey revealed that an equally important factor, which could give an impetus to the process of increasing funding and implementing conventions is political will and recognising the environment's priority in decision making at the highest level. A Strategic Environmental Assessment law should be enforced similar to that successfully introduced in Eastern Europe and the CIS.

Whilst collecting information it was found that even the government bodies that form state policy and perform regulatory and controlling functions in the natural resources management area only knew about conventions in general.

Even the prime-minister Nikolay Tanaev (2005) wasn't aware the Kyrgyzstan had signed the Convention. There are few people in the government who know about the conventions at all because of a lack of a unified state policy regarding signing international agreements and conventions. Was it necessary to join at all? What is the use of them if we don't implement them?

Expert, Bishkek

[6] In March 2007 Ensuring Environmental Security was defined as one of the four priorities of the Country Development Strategy till 2010

Reform of public administration

The survey results show that if properly approached the existing mechanisms could have significantly increased the extent of national funding for GEC by now, but in most cases these funding mechanisms work not for implementing conventions or nature protection/conservation/restoration but in the interests of individual groups of state officials who are responsible for decision making.

According to independent experts who in their everyday work deal with environmental agencies, a corruption pyramid exists in this system that works to enrich its participants and virtually prevents the well-developed legislation in the area of environmental protection from working. The pyramid unfortunately cannot stand the presence of specialists who don't meet its demands and interests. Initiated reforms of the government system and functional analyses of ministries and agencies, including the analyzed sector, have not been consummated. It has turned out that "reform is a constant, baseless and unreasonable change of Government, titles of environmental agencies, reducing the main agency's status from a ministry to an agency and a clearout of experts that cannot live on such meagre wages.

Earlier we had a ranger who wouldn't allow a straight growing tree to be cut – he would immediately fire the person who did it but the situation is different now, a ranger has no power and it is all up to the director

FGD with the population, Issyk-Kul province

Unfortunately, today the authorities which should protect the environment work not for the environment but enrich themselves by using natural resources. Therefore I am absolutely certain that this form of work is very harmful and will be the first to destroy nature, imitating in public the failure and desire to protect it.

Expert, Bishkek

Even money from international organizations for projects is requested and spent in the interests of government officials because both project outputs and quality are accepted by the same state official

Expert, Osh province

Everybody knows that large sums of money have been allocated to combat desertification in Kyrgyzstan but we, as specialists dealing directly with pastures haven't seen any changes or activities in this sphere

FGD with the population, Issyk-Kul province

Take a look at the SAEPF and you'll see that it gets huge sums of money from international organizations. All the government activities on the environment are dying a slow death. It should be stated bluntly that the SAEPF is failing fulfil its functions and a shortage of money is just an excuse

Expert, in-depth interview, Bishkek

The whole country is a trough for government officials. This is characteristic of all CIS countries. Here countries are like private shops where political leaders solve their private problems.

Expert, in-depth interview, Bishkek

According to respondents, the current situation has a long history and the following factors related to management reforms in implementing and funding conventions have been noted.

First of all it is necessary to:

- Ensure maximum participation of the private sector, the public and the mass media in the process (decision-making, control, activity assessment, expertise, etc.);
- Separate the controlling, supervisory and executive functions of the State Agency;
- Make grass-roots level executors more interested by delegating decision-making, planning, implementation, responsibility and expenditure to them;
- Create effective mechanisms to coordinate implementation of conventions at the decision-making level (Government, Jogorku Kenesh);
- Identify who can implement the conventions and establish clear-cut functions for each of them (vertical and horizontal management);

- Develop criteria for judging each participant's success;
- Develop a responsibility mechanism for each participant to judge the failure to fulfil or unsuccessful fulfilment of assigned functions;
- Ensure transparent financial and other reporting on the implementation of conventions;
- Provide state support for training employees of convention stakeholders, civil society and NGOs;
- Monitor and give wide coverage to cases of violations found by nature inspectors and court cases brought by nature protection bodies;
- Control and coordinate external donor aid effectively and avoid duplication of resource allocation.

Fighting corruption and bribery

The most important way to increase existing payment collections would be to introduce comprehensive measures to fight corruption and bribery at all levels and points of contact between representatives (low, middle, higher) of environmental institutions and potential payers. It is important to destroy the existing system where a forester is unprotected from poachers, when the bosses of SPNA and forests work with poachers and bosses of area administrations, courts and supervisory organizations use the resources for their own enrichment rather than nature protection.

All vehicles are supposed to have annual tests to check air pollution levels for which vehicle owners pay fees to the State Auto Inspectorate, but exhausts are not checked at all and on the first floor of the SAI office is a desk where in return for paying a certain amount of money you can get your documents signed confirming your car meets the standards. Corruption has become systemic.

Focus Group Discussion, Bishkek.

Corruption is like a tango it is danced by two. Moreover the one who takes is the one who gives….

Expert, Bishkek

Because corruption in the surveyed structures is systemic, fighting corruption only in government bodies, which form state policy and control natural resources management, will produce no serious results. Respondents are pessimistic

Review and improve instructions and methodological material to reduce areas of corruption
During interviews almost all the representatives of the private sector complained about the inconsistency of formulae and instructions to which inspectors refer when calculating the size of environmental fees and fines, fees for environmental pollution and payment for damage caused to the environment, that in most cases cause distrust, lack of opportunity to argue with inspectors and the subjectivism of inspectors. Making all the regulations related to conventions simple and accessible for payers will lead to reduced areas for corruption and dual interpretation of the size of payments and fines by inspectors. According to businessmen instead of using minimum-maximum formulae, well-defined rates and rules of charging for concrete volumes of pollution must be applied.

Responsibility of state officials for non-performance of their functions
Tight control of and liability for non-, improper, poor performance of functions assigned to a person in implementing conventions and transparency of the process, will significantly increase the inflow of budget funds and external aid and their effective use for implementing conventions. In Kyrgyzstan no state officials can be held responsible for non- or poor performance of his/her functions and performance evaluation criteria; however there are compulsory regulatory norms. Assessment of government officials' performance is done subjectively by a superior. Non-fulfilment of functions, lack of professionalism and actions that have damaged nature are often not reasons for dismissing officials from their positions.

Currently, officials get their salaries regardless of the results of their work. Market mechanisms should be introduced into government workers' pay structures – employees must not get their salaries if ministries don't work well. An attempt was made to introduce this practice in the Ministry of Energy and it worked but then the top management stopped it

Expert, Bishkek

Creating a powerful mechanism of public control, according to experts, is a powerful tool, which is not used sufficiently at present

How to make an official perform his/her functions? It is very easy. Just create bad publicity about the official and this must involve everybody: NGO, mass media, recognized experts and civilians and send letters and complaints to the President so that he won't have any choice but to sack the official

Expert, Bishkek

Enhancing public participation and capacity building of NGO
Effective public control is possible only if several elements are present:
- Mature civil society (both political and expert)
- Political will at the top level of state authorities
- A legislative framework that strengthens the position of public controllers.

Experts believe that the public and NGO must be actively involved: participation in decision-making process, monitoring, control, assessment of implementation progress and active participation by convention stakeholders, initiating and improving legislation etc.

Building the capacity of NGO, particularly environmental ones, fostering a feeling for the environment in civil society, involved parties, businessmen, the general public, foreign and local tourists, civil servants, journalists and lawyers must become an important part of implementing conventions.

Currently we must carry out stage by stage and planned work with the most active participants in conventions – the NGO sector. It is very important to strengthen the potential of leaders, give them technical support and train them in lobbying techniques. We need to have projects focusing on cooperation and gaining experience in working together.

Expert, NGO, Bishkek

Analysis of the targeted allocation of taxes and fees to be spent on the environment

In Kyrgyzstan there are fees from eco-posts, vehicle owners, payments from licensing geological and mining works and others, the targeted use of which arouses suspicion amongst all respondents. There is no transparency over the control of collections and the spending of these funds.

To the best of my knowledge money collected from the eco-post in Issyk-Kul when Shailieva was the province's governor were spent on elections and maintaining the eco-post (30%) and the remainder went to the province's administration, so what funds were spent on preserving Issyk-Kul Lake Itself?

Expert, in-depth interview, Issyk-Kul province

All the eco-posts are uncontrolled troughs for government officials. Doesn't Bishkek need any additional finance? I wonder why it still hasn't occurred to the city administration to set up eco-posts on entering the city. Let all vehicle owners pay for polluting the air in the capital

Expert, Bishkek

According to experts some eco-posts and SPNA have been established illegally as a way of enriching certain groups, which is why fees collected by these structures are spent on many different things, but not the environment. Therefore in parallel with looking at establishing these structures and targeted use of these funds it is important to improve financial accountability, control and transparency. A good transparent system is an electronic one (where a driver buys a card to pass through the post). It should be noted that no experts could remember a case where a high official had been punished for misuse of funds.

Establishing stores for tackling the problem of transporting confiscated property

This measure will reduce the areas of corruption and increase the size of non-budget funding of conventions as currently inspectors have no means to transport and store confiscated property (guns, boats, etc), which makes it easier for inspectors to take bribes from poachers rather than having problems storing confiscated property until court proceedings start.

Sharp increase in payments and fines for pollution from businesses

According to representatives of the private sector sharp increases in payments and fines from businesses polluting the environment (air, soil and water) could boost funding for conventions.

Every businessman must know that it is cheaper for him to protect the environment than damage it for his business's sake. He/she will go bankrupt and no bribe can help them.

Expert, businessman, in-depth interview, Bishkek

Environmental taxes should on no account be introduced for all businessmen. I hear many environmental funds say this. Environmental taxes will kill business in this country. There must be clear and consistent distinctions: which businesses cause and which don't cause damage to the environment, how the damage is measured and how much will be charged for what damage.

Expert businessman, Bishkek

Reforming the work of REPF/LEPF

Due to the low effectiveness of nature protection funds' functions in Kyrgyzstan a number of experts doubt their practicability. It was suggested that Republican and Local Environment Protection Funds be abolished and their incomes be transferred directly to the national budget to fund the relevant activities. Others suggest reforming REPF/LEPF through creating transparency, accountability, maximum public participation in their activities, control, assessment and decision making and developing cost efficient

funds and environmental impact criteria. World practice shows that Environmental Trust Funds, which are established by the state and managed by it jointly with NGO, are also good financial mechanisms (i.e. the Ecological Fund in Poland).

Change of fiscal policy at local level

Existing state fiscal policy doesn't stimulate grass root structures, for example, make SPNA self-funding as the mechanism for using self-earned money means they have to be approved by the SAEPF, which takes time and a risk these funds will be used for other things.

In practice SPNA don't show all their revenues and only 50-60% are transferred to special accounts. All unregistered money is spent not on developing the SPNA but for agency or personal needs by the leadership of SPNA, superior bodies and local authorities. This situation satisfies everybody, which is why no one is interested in talking about or changing it
Expert, Jalal-Abad province

According to respondents strengthening potential at local level and decentralising decision making functions will lead to increased funding for global conventions and make local level representatives more interested.

Building experts' capacity

According to respondents there is a lack of professionals for all three conventions. Kyrgyzstan could attract huge international funds within a clean development mechanism (CDM) but receives miserable aid, as national and sectoral strategies do not include and support these objectives. One of the important reasons for that is a lack of specialists and legislation in the area of CDM.

A serious analysis is required of which specialists are necessary for each convention, which structure they must be working in, where they can be trained or have their qualifications upgraded. This is not done on a systematic basis and as a result the SAEPF should reconsider everything concerning climate change development strategies, country priorities, improving qualifications and use of external aid in the energy sector, agriculture, construction, administration and municipalities.
Expert, international Bishkek

Systematic approach, concentrating finance in one pair of hands

Analysing the interviews gives the impression that the state is not interested in working with stakeholders in conventions systematically. The survey revealed that there are no clear answers to simple questions on finance: how much money has been spent to implement conventions or where it comes from, how much and for what purpose it was spent and what the priority was in spending the funding. It is easier for state officials to report on the work of international projects or NGOs but not on the work of state agencies. Despite conventions having been ratified there are no well organized mechanisms of coordination, monitoring, financial accountability or responsibility, which must be established immediately if funding is to be taken more seriously.

- They carry out activities on implementing conventions but look what ayil okmotu write in them.
- Who forces them to make plans and who accepts bad quality documents?
- Provinces force them to do it but do not understand that it is also a reason why such plans are not implemented therefore it is difficult to report who has done what under each convention.
Expert, Bishkek

Representatives of the Ministry of Finance have expressed their concerns over the lack of transparency of receiving and allocating international funds at the SAEPF.

It should be noted that most experts think the activities on GEC implementation must be largely funded on the residual principle. In the opinion of many respondents a specific article for environmental activities

GEF funds must be more transparent. Unless the Ministry of Finance is informed about both the element and category of funding let alone about the physicat implementation I think, there will not be a consensus of opinion.

Expert, Bishkek

in the expenditure part of the republican budget is necessary.

The Ministry of Finance has never monitored all receipts of the SAEPF for which it would be rational to abolish all funds, special accounts and transfer all funds including those from international organizations to the budget and fund environmental activities including conventions from the budget on all accounts (not only salary and social fund).

This good idea causes some anxiety, especially if it is done without radical reforms of public administration in the area of environmental protection.

Given the level of corruption in Kyrgyzstan, centralising all funds in one pair of hands could create even more corruption including in the NGO sector that would lose its independence as all projects would be financed from the budget. Potentially there is a great risk of the funds of international organizations and the NGO sector being used for personal gain.

Additional funding sources for GEC
Involving business in environmental activities, rational nature management and, promoting clean technologies and products

Undoubtedly environmental activities create additional jobs, improve peoples health by saving on medicine and sick leave, longer life expectancy, etc, but these factors are difficult to evaluate and measure in monetary terms.

According to business structures there is no mechanism in Kyrgyzstan to stimulate saving natural resources and developing and using clean technologies. The main stimulating mechanism for businesses must be tax concessions.

Economic benefits can make businessmen care about the environment

Businessman, Bishkek

As the size of the economy and demand for organic products is very small, international cooperation should be developed, e.g. the difference between the price for honey uncertified and certified as organic is tenfold but the purchasing power of the internal market is very low, therefore markets for organic products are needed abroad.

Most importantly tax concessions need to be thought about and created: the less natural resources that a businessman uses the more tax concessions he/she should receive, after which business will find ways to integrate into the environment.

Businessman, Bishkek

A mechanism of environmental incentives for businessmen could also be bank loans based on the Equator principles - a set of voluntary principles developed and adopted by banks for assessing environmental and social risk when providing project funding based on nature protection and social standards applied by the International Financial Corporation (IFC) – a part of the World Bank funding the private sector. These principles are applied globally when funding the bank's projects worth more than 50 mln USD.

To invest money in enviromental activities ratyional nature resourses manegement and promoting clean technologies and products a businessman mast be confident that no one will take over his business. We had bitter experiences of this when several businesses got licenses and started to work at the municipal rubbish dump, but when the city administration saw that it was a profitable busines it desided to take over this busines. Today bussinsmen have given up the idea and the Mayor·s office has done absolutely nothing and the dump is still growing.

Expert, Bishkek

Respondents think that the most promising areas for businesses related to conventions are:

1. Using natural resources
2. Promoting clean technologies and products
3. Promoting alternative energy sources (CDM projects, promoting biogas technologies, micro hydro power units (MHPU)
4. Environmental tourism
5. Scientific/educational/adventure tourism
6. Game fishing
7. Game hunting
8. Secondary processing of agricultural produce, herbs etc
9. Intensive technologies in agriculture
10. Energy efficiency and conservation
11. Developing environment-friendly agro methods etc.

Many businessmen said it is necessary to improve the legislative base, run information campaigns, training courses and promote information about technologies, scientific-research work and state guarantees to involve their funds in the above-mentioned directions.

Ecotourism, scientific, educational and adventure tourism

Ecotourism is more widely spread today as an additional income source; however there could be scientific tourism, particularly ornithological tourism. SPNA have routes and pricelists developed Almost all SPNA have some experience of working with foreign tourists, but the number of foreign tourists is small (up to 100 people a year). SPNA administrations have no knowledge on how to attract tourists, organizing food and accommodation, and guides with knowledge of English for them. Respondents noted that special attention to developing tourism in SPNA should be given to building infrastructure (roads, tracks, parking places, areas for campfires, cooking food, etc) Interventions in SPNA must be made in accordance with nature protection norms and based on consultations with specialists.

All SPNA workers asked that their specialists and local people be trained in environmentally friendly tourism. The locals wish to earn money by providing guest houses and yurts, selling kymyz (fermented mare's milk), nuts, fish, products from felt and national souvenirs, but the lack of support from the government, businesses and international organizations hampers the process.

In practice leaders of SPNA have to solve these problems on their own. Serious work must be under taken to develop the ecotourism concept, carry out planned and systematic activities at least at the level of ministries, governors of provinces and top government authorities. Tourism companies of Kyrgyzstan, Kazakhstan and western countries are interested but neither the Ministry for Industry, Transport and Tourism, the SAEPF nor the Ministry of Foreign Affairs are doing anything.

Scientific/educational/adventure tourism has good potential, as the scenery and biodiversity of Kyrgyzstan is very varied and school trips from the capital would not only be an additional source of funds for GEC but also serve to educate the country's young people about the environment.

Even though these areas are supported at all levels of the State Agency, it should be noted that developing

tourism creates big risks from the viewpoint of ecology and the environment should there be inadequate control over tourism agencies.

Game fishing and hunting

The survey showed that some businessmen are interested in developing game fishing and hunting, but on the other hand, they noted the need to define a list of fish and animals that could be caught and artificially bred

Science

There is virtually no scientific work in SPNA or Giprozem, as the National Academy of Science of the KR and other structures cannot in the near future increase funding for global environmental conventions or give tangible results of their implementation. The most important problems are: lack/shortage of funding for scientific research, weak professional level of staff and weak involvement of scientists in international programmes and projects.

Now only those left in science are those who cannot work anywhere else

Expert, in-depth interview, Bishkek

I produce mini/micro HPU (hydro-electric stations). I need information on scientific developments on the speed of steep flumes and the energy potential of rivers and reservoirs where I can build MHPUs. Unfortunately there is no such information. It would be great if it could be obtained from some scientific institutions.

Expert/Producer of MHPU, Bishkek

Environmental education and awareness

If we want to implement GEC, the problem as to whether or not the population understands and supports them is more important than funding and we should ask ourselves this question before signing conventions. A systematic approach to environmental education must become part of implementing conventions. It is important that all strata of the population and people of all ages receive environmental education

Expert, Bishkek

Improving legislation

In general the republic's legislation on the environment meets the existing requirements but needs a number of substantial amendments. The main problem is that laws set out frameworks and references but as a rule, all mechanisms are developed in subordinate legislation (bylaws), which then undergo formal concordance with other ministries/institutions and consequently reflect institutional interests, contradict each other and don't comply with domestic and/or international legislation.

According to experts domestic legislation must help attract businesses and strengthen the position and activeness of civil society, NGOs, interested parties, local communities, etc.

5. POTENTIAL INTERNATIONAL MECHANISMS FOR IMPLEMENTING CONVENTIONS

There are many different sources from which external aid for implementing various environmental projects in Kyrgyzstan could be attracted. In funding priority is given primarily to projects that are being implemented in compliance with the commitments of the country under the GEC and the priorities of the country reflected in national strategies and programmes.

External aid is an important source of funds for implementing pilot projects, attracting best practices and promoting procedures and mechanisms for sustainable natural resources and environmental management, strengthening institutional, technical and human capacity and implementing international commitments under international agreements and projects improving access to resources and infrastructure.

These sources can come as grants, technical assistance and concessionary long-term loans and technical assistance comes in the form of equipment, used both for the sustainable use of natural resources and monitoring the environment. The country receives concessionary loans to improve access to resources (drinking and irrigation water, land and bio-resources) and economic infrastructure and help give double benefits: (1) by increasing jobs and consequently sources for overcoming poverty; (2) by decreasing direct pressure on natural resources and the environment.

The main source of grants for implementing projects to meet commitments under conventions is the Global Environmental Facility – an independent financial organization providing grants to developing and transition countries to get global environmental benefits and support sustainable jobs in local communities.

Currently, more than 160 countries have joined the GEF and since 1991 it has funded more than 1,300 grant projects worth 4.5 bln USD in 140 countries worldwide and attracted co-funding worth 14.5 bln USD. From 2002 to 2006, 32 countries – GEF donors - allocated more than 3 bln USD to fund projects.

The above-mentioned new funding frameworks do not extend to projects to combat desertification but GEF assistance will soon be rendered under the National Framework Programme (NFP) on sustainable land resources management, which in its turn is financed under the CA Initiative on sustainable land resources management – a programme supported by a group of donors headed by ADB. The NFP provides for aid to Kyrgyzstan till 2015 worth 68 mln USD, 15 mln USD of which is a GEF grant and the remainder should come as investments and concessionary loans. There is a GEF Small Grants Programme in the country, which provides grants to NGOs and community organizations in the main GEF areas for attaining global benefits at local level.

Other large grant sources are:

- The Special Fund of the Montreal Protocol to the Vienna Convention on the depletion of the ozone layer funding projects to reduce the use of ozone-depleting substances;
- UNDP, which attracts funding and co finance for a number other environmental projects. Planned contributions to these projects within the next 5 years will reach 3 bln USD
- TACIS supported by the EC is starting a project to support sustainable development in Central Asian countries
- International Development Agencies such as Japan International Cooperation Agency, GTZ, Swiss Coordination Office, CIDA, SIDA, USAID, DFID and others provide grant support to implement projects supporting the fulfilment of commitments under GEC
- Direct donor aid from donor-countries, e.g. Finland, Norway, etc.
- WB loans and grants

Swapping external debt for sustainable development is another attractive mechanism for attracting funds to achieve the goals of sustainable natural resources management and fulfilling commitments under GEC. The government, with OECD and UNDP support has carried out the work necessary to assess the need to exchange external debt for sustainable development and identify the mechanism, principles and procedures for this exchange.

CAPACITY BUILDING OF SPECIALLY PROTECTED NATURAL AREAS

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INTRODUCTION

Today there are 85 different sites that form a network of Specially Protected Natural Areas (SPNA) that cover 9,050 km2 or 4.5% of the Kyrgyz Republic's landmass. Unfortunately the significance of preserving SPNA from the biological and ecological point of view is not understood by either the population or decision-makers who mostly do not have ecological educations, therefore SPNA are not considered invaluable property, the pride of the nation that are of national importance for Kyrgyzstan. At the national level SPNA are not represented as one of the main institutions and sources of the population's wellbeing.

This survey is devoted to identifying SPNA problems in Kyrgyzstan in terms of considering the capacity of the specially protected natural areas as a source for restoring and conserving the republic's biological diversity.

1. RESEARCH AIMS AND METHODOLOGY

The aim of this survey was to provide the State Agency for Environmental Protection and Forestry (SAEPF) and the UNDP Capacity Building and Environmental Governance Strengthening for Sustainable Development Project with information about the problems and needs of SPNA to ensure increased biodiversity conservation capacity in the Republic. To achieve this objective a working group of interested agencies and independent experts was formed and it was closely involved in designing this survey and the tools used.

Target groups

- 1,700 people living in SPNA buffer zones (Reserves and National Parks).
- Experts – representatives of stakeholder organizations, i.e. directors, rangers, forestry officials and hunting experts of the protected areas, local government officials, forestry service specialists and others.

The survey considered the opinions of about 1,800 people

Surveyed settlements

During project meetings six settlements were selected to be surveyed. The problems of SPNA served as the criteria for selecting the points and specialists from the SAEPF were closely involved. As the survey shows, each selected area is unique and has its own specific problems. During the analysis this allowed us to draw an overall average picture of all the surveyed areas, therefore, the analysis is presented as different problems occurring in various SPNA. Table 1.1. shows the selected areas and the problems in each settlement.

1.1. Survey locations showing specific problems

Province	Interview Point	Problems
Issyk-Kul	Karakol State National Nature Park	Unauthorised timber felling, close to the city of Karakol, strong pressure on the buffer zone, Protected Area – only recently
Chui	Ala-Archa State National Nature Park	Unregulated tourism, pressure from the capital, affiliated to the President's Office of the KR.
Jalal-Abad	Sary-Chelek State Reserve	The village is inside the reserve. Strong pressure from the village, plus the community's specific problems
Naryn	Naryn State Reserve	Pressure on the buffer zone, development of an ore deposit, problems of rare fauna

Talas	Kara-Buura State Reserve	Pastures were somehow included in the reserve, resulting in unauthorized grazing and worsening problems with local communities
Issyk-Kul	Issyk-Kul State Reserve	Constant staffing problem and authoritarianism. Pressure from the province administration.
TOTAL	6	

Data Collection Methods
Data was collected using both quantitative and qualitative methods.

- A quantitative method was used to interview communities in selected buffer zones.
- Qualitative methods consisted of in-depth but loosely-structured interviews with experts and Focus group Discussions (FGD) with buffer zone community representatives. The experts were specialists working in the interests of the protected areas – state officers from key government agencies, Parliamentary deputies, owners and representatives of private enterprises and organisations and specialists from international projects and NGOs.

2. SUMMARY OF SURVEYED AREAS[1]

Kara-Buura State Reserve
Area – 69400 ha.
Established in 2005

A high-mountain area with relatively untouched large mammal and bird populations and pastures of mainly poor or medium degradation and rare species of plants and animals such as the Tien-Shan Argali, snow leopard and large birds of prey, can be found in the reserve.

Main problems and threats: the most imminent threat to biodiversity conservation of large species is the constant poaching and illegal grazing of animals on the pastures of the reserve.
The damage caused by illegal access is quite extensive and its intensity is speeding up.

The communities look quite negatively on banning animal grazing and reckon transferring land belonging to the villages to the reserve to be illegal. This season permission for animal grazing was given corruptly (payment was made in cash to rangers per head of livestock). Residents of the buffer zones are even planning to picket Government House and the SAEPF in Bishkek, as the decision by the province and local administration to withdraw from the reserve the pastures, belonging to them, has not yet been implemented.

Other kinds of anthropogenic impact, such as animal grazing and the felling of high-mountain forests are not that intensive at the moment, but in future this impact could increase many fold.

Sary-Chelek State Reserve
Area 23,900 ha.
Established in 1959 and in 1978 given UNESCO biosphere status and it was included in the international network of biosphere reserves.

It is a high-mountain area, inhabited by 157 species of birds, 5 species of reptiles, 3 species of amphibians, 5 species of fish and 35 species of mammals. On the slopes at 1,200-2,100 m grow unique relict walnut and fruit forests, consisting of walnuts, wild apples, pears, and hawthorn and at 2,100 m coniferous forests. There are more than 70 species of medicinal herbs and about 1,000 species of grassy plants and

[1] SPNA characteristics are based on a short-term expert's report on the development of the medium-sized project on Biodiversity Conservation in Southern Kyrgyzstan by Demonstrating Integrated Agricultural Approaches to Biodiversity Conservation
2. Talas oblast State Administration Resolution № 128 dated 9 august 2006

113 species of trees and shrubs, of which 30 are in the Red Book (of endangered species) of the Kyrgyz Republic. The reserve contains deer, wild boar, mountain sheep – argali, snow leopards, Turkestan lynx and Tien-Shan brown bears.

Main problems and threats: the reserve is under constantly intensifying pressure from the communities in the buffer zone that extensively use the resources of the reserve through both official access (collecting nuts, berries, fruit, brushwood, etc.) and poaching (hunting animals and birds, illegal fishing, extracting burl walnut, illegal felling of timber, illegal grazing, etc.). The damage inflicted is extensive and the intensity of illegal access is inadequately controlled.

Ala-Archa National Nature Park
Area 2280 ha.
Established in 1976

There are more than 600 species of high plants growing and 26 species of mammals and more than 100 species of birds living in the reserve. Species in the Red Book living here are: snow leopards, lynx, snake eagles (Circaetus), greybeards, Himalayan griffons and falcons. The main aim is to protect the environment in the Ala-Archa Gorge and organise entertainment for people and their guests.

The main problems and threats are caused by the inflow of tourists, who litter the area, illegally kill rare plants and destroy springs. The damage inflicted is extensive and efforts to protect the environment are inadequate.

Naryn State Reserve
Area 36969 ha.
Established in 1983 with the aim of protecting the environment in the Inner Tien-Shan

There are 21 species of mammals, more than 100 species of birds and about 500 species of tall plants protected in this reserve. Snow leopards, lynx, bears, argali, maral and birds of prey and rare birds can be found here. Of the species listed in the Kyrgyz Red Book, there are 5 species of mammals, 6 species of birds and 10 species of insects inhabiting the reserve. The reserve is the only place in Kyrgyzstan, where a local population of Tien-Shan marals can still be found and there is a maral nursery here, which was established to breed them.

Karakol State Natural National Park
Area 8450 ha.
Established in 1997 with the aim of preserving the unique environment of the Karakol Gorge and providing a recreational area
There are more than 700 species of plants, 23 species of mammals and 150 species of birds in the park.

Main problems and threats – pressure from the buffer zone and the proximity of the large town of Karakol, whose population is used to using the national park for recreation.

Issyk-Kul State Reserve
Established in 1948 in order to preserve the marshes and bird populations of Issyk-Kul Lake
Area 19,086 ha.

The reserve covers 10 separate areas of land stretching 400 km along the lakeshore of Issyk-Kul Lake and 7 areas of of the lake, covering a little more than 20 thousand ha. The area protects 24 species of mammals, 232 species of birds and more than 300 species of tall plants, of which 11 species of birds and 13 species of insects are in the Red Book. The reserve's main task is to protect the winter habitats

of waterfowl. Every year from 40 to 60 thousand birds spend the winter here and in spring and autumn the lake is a resting and feeding place for migrating flocks of Asian waterfowl, so hunting is banned on the lake and for 2 km around it.

Main problems and threats: the reserve is under constantly growing pressure from the adjacent settlements and pollution caused by tourists picking medicinal herbs illegally. The inflicted damage is extensive and the intensity of illegal pressure is inadequately controlled by the reserve's staff.

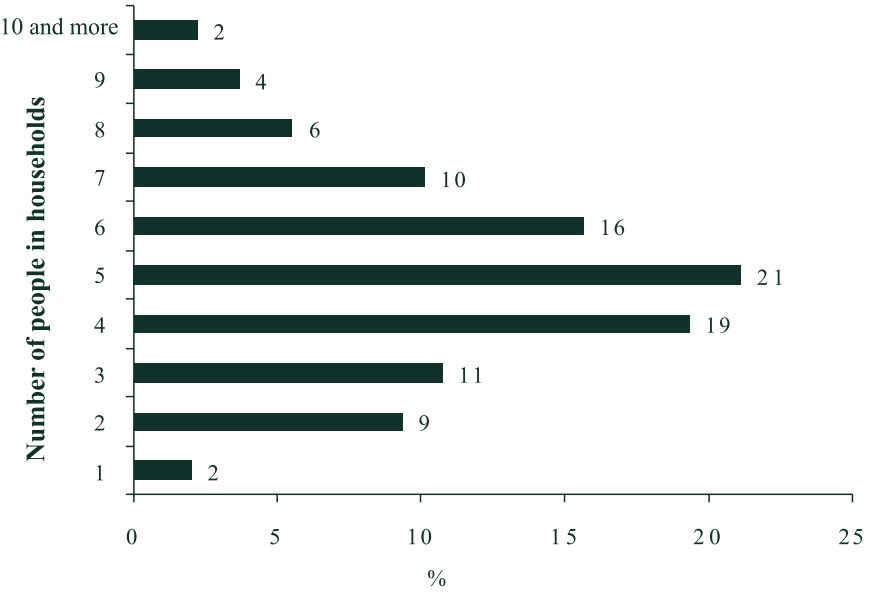
3. CHARACTERISTICS OF THE PEOPLE LIVING IN THE BUFFER ZONES

Social characteristics

The villages in the buffer zones are mainly mono-ethnic, i.e. almost all the inhabitants are native Kyrgyz and they are mainly employed in the SPNA, schools, village administrations and post offices. Men are usually hired by the day to work in the neighbouring villages or engaged in building and agriculture. Women run the homes and work on their own land plots.

Due to the economic and demographic changes in the last 3-5 years unemployment has increased the pressure of all these villages on SPNA e.g. the number of households in the village of Arkit[3] has risen since 1997 from 160 to 220 and the population from 900 to 1,100 people. The number of able bodied people, more than half of which are unemployed, is 516, whilst the number of jobs is constantly falling e.g. the reserve, which is the main employer in 1989 employed 128 people against 68 today. According to experts and the population, young people in these villages have problems in finding jobs after leaving school and usually go poaching – collecting herbs, hunting, catching fish or cutting down trees. However, the leadership of the reserve and the local government has to put up with these violations and turn a blind eye to the growing pressure on the reserve, as they believe that the population has no other choice. A similar situation applies in other villages in the buffer zone.

Figure 3.1. Number of households



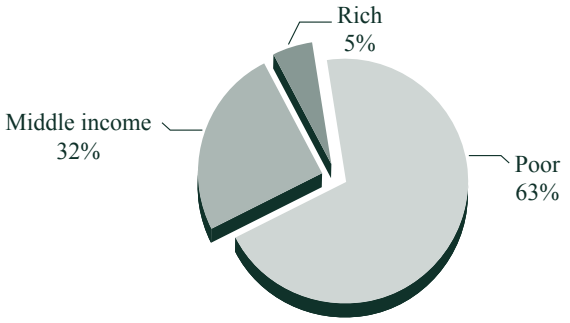
[3] The village of Arkit is in the Sary-Chelek State Reserve

Figure 2.1. shows that in most cases the number of people in each household ranges between 4 and 7 (56%). A fifth of households have seven and more members and the same number of small households has less than three people.

Poverty

The subjective poverty structure of the population is shown in Figure 2.2. where according to the respondents some two thirds of their village are poor, a third – middle class and 5 % are rich.

Figure 3.2. Subjective assessment of poverty

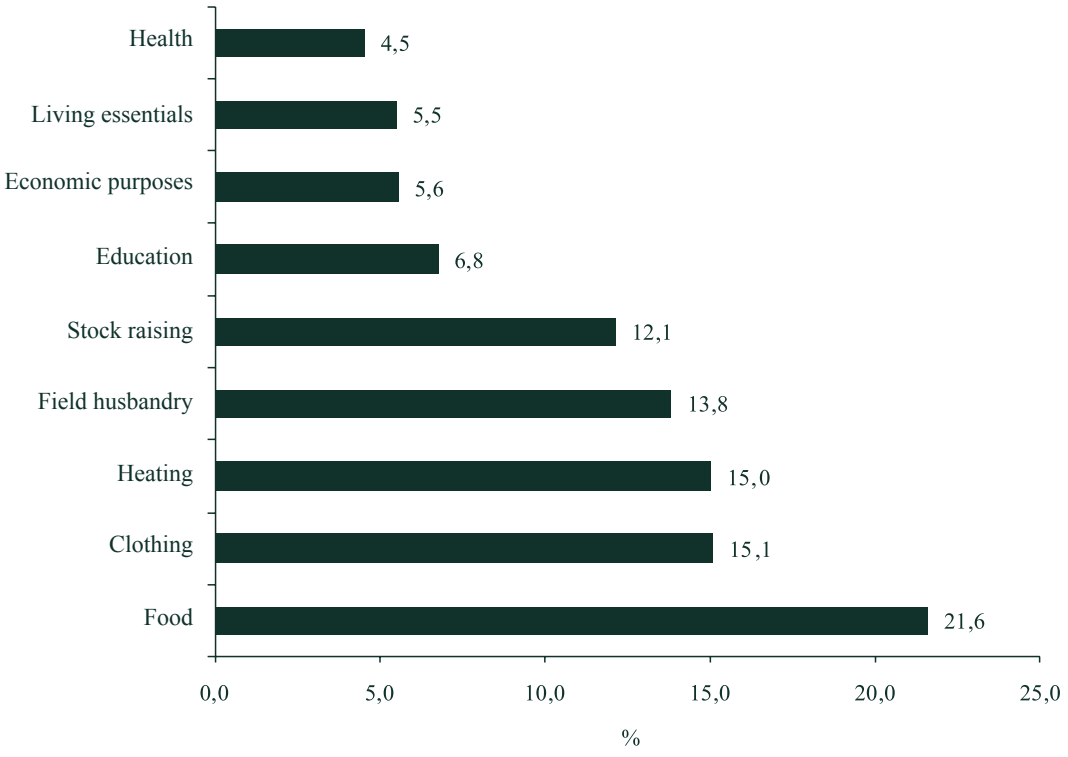


According to respondents the monthly income of each household member in poor families is 264.9 soms, in middle class families - 734.6 soms and in rich families – 1,396. 5 soms. The gap between income levels, in the opinion of most respondents, is too big.

Income and expenditure

The expenditure patterns of households, shown in Figure 2.3. shows that for the population of the surveyed areas livestock breeding plays an important role and money goes on food, clothing and heating for people in the buffer zone and in total accounts for a quarter of their income.

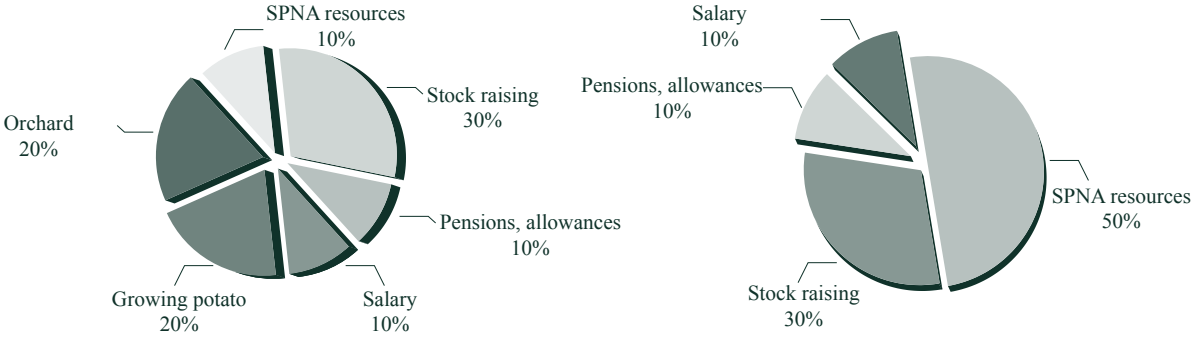
Figure 3.3. Household expenditure pattern



According to residents of the villages foodstuffs include vegetable oil, salt, matches, sugar, tinned fish, alcohol and soft drinks. Other products (meat, milk, butter, potatoes, vegetables, flour, etc.) are produced on their own farms.

Survey data show that the expenditure pattern varies between surveyed settlements and so does the income from using SPNA - 40% -100% of respondents from the buffer zone use the resources of SPNA and so the dependence level of people's well-being on the resources of SPNA differs. Here are some examples.

Figure 3.4. Income pattern of the buffer zone population



All residents of Sary-Chelek without exception use the resources of the SPNA: they collect firewood, harvest walnuts, hunt and catch fish and so the dependence level of the population on the resources of the reserve is very high. Also highly dependent on SPNA resources are the people living in the buffer zone of the Kara-Buurinsky State Nature Reserve, where almost all households engage in illegal grazing. Lower dependency levels were observed in the Issyk-Kul State Reserve and Karakol National Nature Park, where the use of SPNA resources is less intensive. The most dependent on SPNA are the residents of the buffer zone of the Naryn State Reserve and Ala-Archa National Nature Park. The survey shows that the intensiveness of resource use depends on several factors, the main one being the proximity of populated settlements to the SPNA and the population's access to its resources – timber and wild berries

4. PROBLEMS OF SPNA

Lack of priority of the environment in the country's development

Experts and the population believe that in Kyrgyzstan the environment is not a priority for the country's development. This is reflected in the attitude to environmental problems in decision making at all, vertical and horizontal, levels of authority and is most clearly seen in that financing for the environment is done on the 'leftover' principle and priority is given to areas yielding immediate benefits. Thus, for example, in the opinion of people living within the Naryn State Reserve, despite the negative effects of mining-exploration near the protected area on the population of marals, top level officials say "this deposit is promising and is more important for the country than preserving marals"[4]

> If state reserves had more support from the government or there had been powerful civil society movements protecting their interests, everybody, including economic entities, the population and officials of environmental bodies would have to reckon with them but neither the government nor civil society feel these reserves are important today – they think that reserves are important for fools like me, who study nature.
>
> *Expert, Bishkek.*

[4] Here and further on the opinions of experts are cited in inverted commas with virtually no correction

Nature Protection Concept

This approach has been widely practiced since the soviet period, when all efforts on nature protection were aimed at preserving certain species of animals or plants. According to experts this approach cannot be used anymore as the need to conserve complete ecosystems today has been recognized all around the world, which is why experts think that an environmental and SPNA concept should be developed today at state level and in their opinion, is crucial for determining the course of environmental development.

> *We, for example, protect only the snow leopard, not the areas it inhabits, but a certain species. We keep count of the leopard population but don't take into account preserving the ecosystem so we lose a lot because the Red Book species are merely indicators of the state of the ecosystem, therefore we need to change our approach*
>
> *Expert, Bishkek*

Institutional system

Figures 3.1 and 3.2. show the subordination of the SPNA. According to the current legislation, SPNA are directly subordinate to the SAEPF and Directors of SPNA are appointed on the recommendation of province administrations and approved by the SAEPF. Reports on the state of SPNA are regularly given at regional gatherings and SPNA are also "linked to an area" as they use regional infrastructure - roads, electricity transmission lines, transport, etc. Therefore in addition to the vertical subordination, SPNA have horizontal subordination. The direction of subordination in the diagram below is marked with ar-

Figure 4.1. SPNA subordination scheme[5]

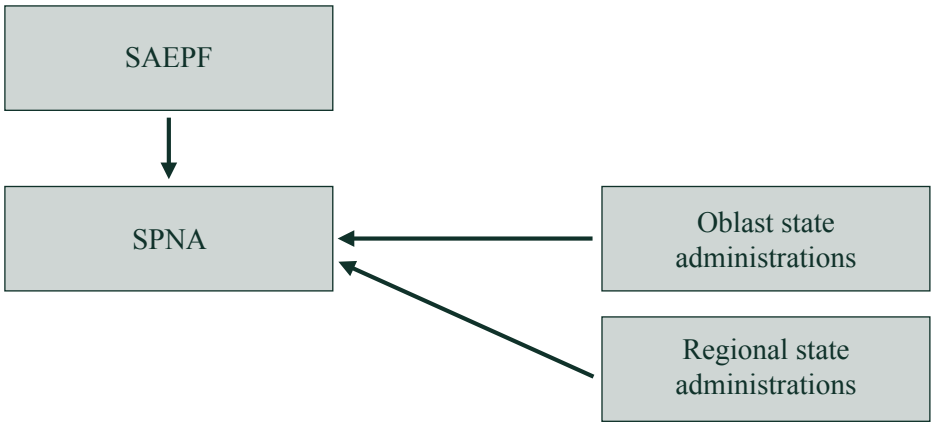
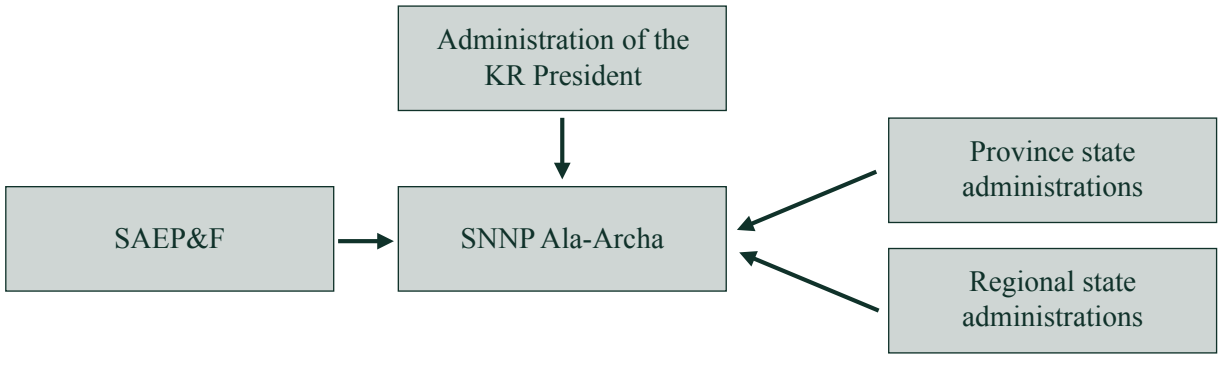


Figure 4.2. Ala-Archa State Nature Park subordination diagram



[5] Except the Al-Archa State National Nature Park

Thus all SPNAs except the Ala-Archa State Nature Park are directly subordinate to the SAEPF on which the dependence level is quite high.

The dependence factor on province and regional administrations according to respondents is "directly proportional to the geographical proximity to the region or oblast", i.e. the closer the state administration is to the SPNA, the higher the level of dependence. As the survey shows, in most cases regional administrations are located nearer than the province administrations, consequently, they have a bigger influence on the SPNA.

The situation with the Ala-Archa Nature Park is somewhat different because unlike the others this nature park is subordinate to the Administration of the KR President and is only under SAEPF control on paper. Due to its special status the park is less dependent on province and regional state administrations.

We couldn't try to make the Ala-Archa State National Nature Park report to us, let alone inspect the area. In my opinion, this site hasn't been inspected for many years, which is why we don't know the actual state of its biodiversity, fauna and flora.

Representative of the SAEPF, Bishkek

State and monitoring of the SPNA

The survey data show that assessing the state of SPNA varies among respondents and different opinions exist about them, mainly due to a lack of precise monitoring of the state of the flora and fauna and environmental activities and violations in many SPNA. "Frequent changes of SPNA directors, who don't have enough time to do anything" also have a negative effect.

Among the positive assessments of the state of SPNA were such aspects as extending the SPNA areas and establishing new nature reserves that, in the opinion of many respondents contribute to protecting the biodiversity of natural ecosystems.

The state of our SPNA has improved because earlier T. Shailieva (ex-Governor of the oblast) took away up to 100 cubic metres of timber every day but now less wood is taken away

FGD population of the buffer zone, Issyk-Kul province

According to respondents the state of the SPNA system is unsatisfactory as "today state nature reserves are exploited as national parks, which have been turned into forestry businesses". According to them SPNA are inadequately protected from anthropogenic impact and the attitude towards SPNA at both regional and republican level is consumer-like. During the interviews respondents often emphasized that violation of the SPNA regime "reduces their effectiveness to zero". This attitude results in reduced populations of rare animals and plants and a depleted ecosystem.

According to the heads and senior specialists of SPNA the state of their SPNA have, in the past 4-5 years, stabilized. This conclusion is based on nature studies, scientific observations, information on the death rate and population of animals and diversity of flora, which are collected by scientists. In those SPNA, where scientific jobs have been lost, the state of SPNA is assessed by the management 'by eye' and is mainly based on the subjective views of rangers and hunting experts and rarely on first-hand observations.

However, the populations in buffer villages of most SPNA believe that in the last 3-5 years the state of SPNA has significantly worsened – "animals have gone extinct including the rare ones and the flora has been depleted". These people base their opinions on their own observations, which seriously challenge those of the SPNA bosses. Residents reported that "some 5 years ago we could see animals there but today they have disappeared", "Deer and kudu have been killed by foreign hunters", "Our birds of prey are caught to be sent abroad". In the opinion of the population, the state of the flora

is also worsening –"we have many relict walnut trees that are being depleted for their burls", "in the season hundreds of people gather nuts, destroy the bushes and frighten the animals", "licorice root is dug out in great quantities and no one controls it", "you can rarely see flowers here because they are also harvested in uncontrolled amounts", "earlier one could see meadows of marjoram and St-John's Wort here – now you have to go far into the mountains to find them", "earlier there were a lot of raspberries", "buckthorn is cut together with the twigs, so now you can hardly find them".

I am a hunter and earlier, when hunting I would see the prints of wild animals: deer, bear, hare, badger, wild boar. Now I seldom see such prints.

Survey respondent, Issuk - Kul province

When I was at school, deer would come near the village and also there were many boars. Now you can hardly see deer and the boars have all been eaten by the people".

Survey respondent, Issuk - Kul province

The administrations of SPNA explain the subjective assessment of the people by saying, "people always exaggerate problems", "before the population had fewer domestic appliances but now each house has a TV and in the evenings they turn on the lights and music and make noises, which frighten the animals so they go into the heart of forests. Therefore they think that the animals have become extinct", "the population doesn't understand the issues of the state of SPNA".

Such contradicting opinions, first of all, show a lack of a single method and approach to assessing the state of SPNA both in individual SPNA and communities at the administrative level. It is necessary to note that the existing indicators on SPNA are fragmentary and consist mainly of quantitative indicators, which don't reflect qualitative changes.

In Soviet times monitoring was carried out systematically and qualitatively. Even maps from space would be made, which enabled many things to be determined. Now we are willing to monitor and count the animals, but we don't have the resources for that. International organizations have promised to provide resources this year so maybe now we can carry out monitoring at last.

Head of SPNA Issuk - Kul province

There is no single monitoring and evaluation system especially for reserves. Monitoring is part of the management process; it shouldn't be big, as it is not scientific research. It should be simple and not too costly. We have had two small environmental catastrophes – a locust invasion and the large-scale death of birds of prey and fowls, due to using rat poison made in China, which is very toxic and dangerous to animals. The results have not been evaluated. If there had been monitoring it could have been avoided. We have spent a lot of money on containing the spread of locusts, one percent of which would be enough to prevent them. The Ministry of Agriculture and SAEPF both fought the locusts but one agency doesn't know what the other is doing.

Expert, Bishkek

Experts believe that monitoring the environment is necessary, "only then we would be able to judge the dynamics of the state of SPNA more objectively and understand what the normal state is and how far we are from that state". As a basis for such work it was proposed to make the main task of SPNA the protection of an area from anthropogenic impact. Therefore it was suggested to systemize a list of anthropogenic impacts for each SPNA and assess the effectiveness of reserves in carrying out protection measures against the identified impacts. The following list of SPNA impacts, which should be introduced into the monitoring has been drawn up,:

- Tourism in the SPNA
- Hunting and fishing; logging; harvesting of wild berries and mushrooms, medicinal plants etc.
- Livestock grazing, agriculture and other technological violations of a reserve's regime;
- Geological and exploration works carried out in the area;
- Pollution of SPNA;
- Human settlements within and around the reserve.

The following measurable indicators were also proposed to be included in the monitoring:

- Financial indicators
- Staff
- Indicators of the warden/ranger service
- Information on fires and catastrophes
- Environmental awareness raising activities
- Research activities
- Economic activities of the reserves.

SPNA Funding

Figure 3.3 shows the funding diagram of SPNA. The survey revealed that state funding is provided only for salaries and social fund deductions, which shows the lack of priority given to SPNA by the state. Analysis found that salary levels in the SPNA system are some of the lowest in the republic – for example, a ranger's wage is 500-700 (1 USD = 36 soms) soms monthly and this does not encourage SPNA workers and on the contrary, it forces them to seek other income sources, which in most cases is by giving unofficial access to SPNA resources. The population, for example, sees rangers and foresters, as "legalized poachers".

SPNA themselves raise funds for their activities therefore, the funding of environmental activities with the help of international organizations and through special accounts is becoming more important.

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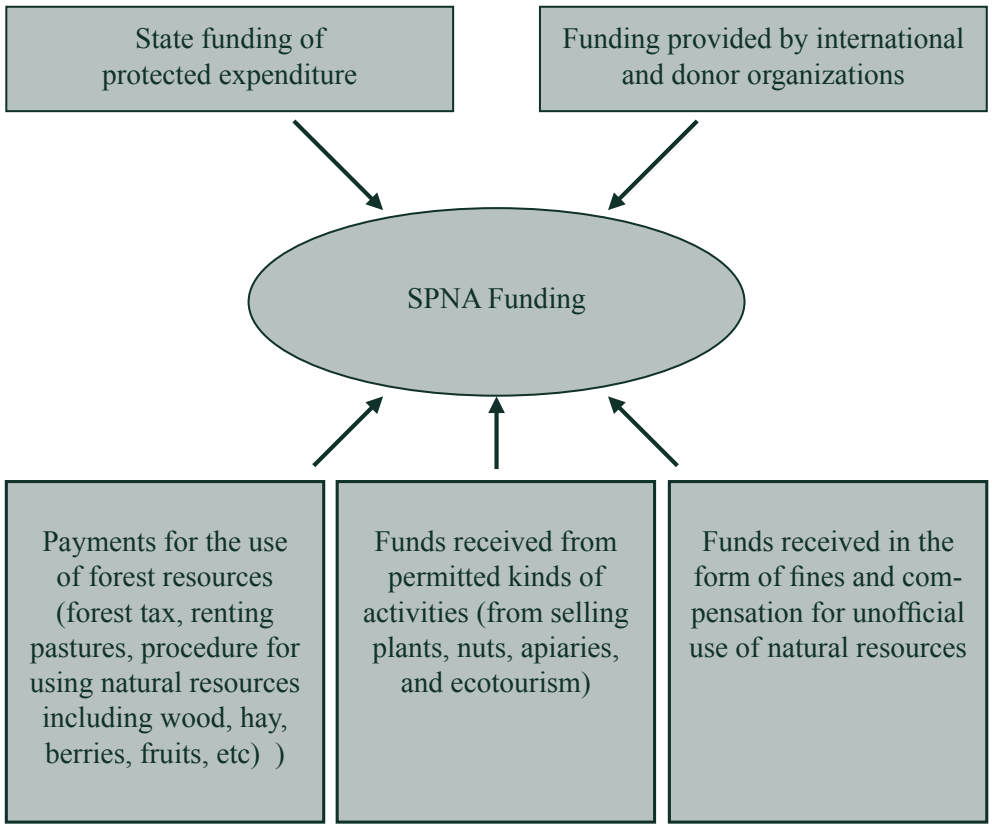
Figure 4.3. Funding sources of SPNA



Studies of the structure of special accounts have shown that there is a significant difference between special funds formed by reserves and nature parks. The differences are based on the various purposes of environmental organizations and their legal status. Reserves, for example, legally have no way of engaging in economic activities, therefore the main source of special funds for them is from ecotourism, which accounts for 70% of the total amount of special funds. The remaining part is made up of payments from the population of buffer zones for collecting wood, harvesting natural resources (nuts, berries, and fruit) and apiaries

Figure 4.4. Pattern of special funds in nature reserves

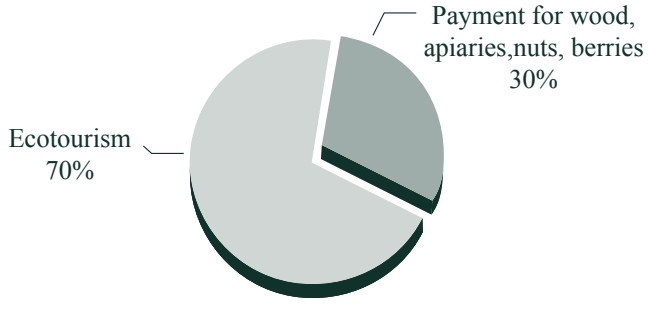
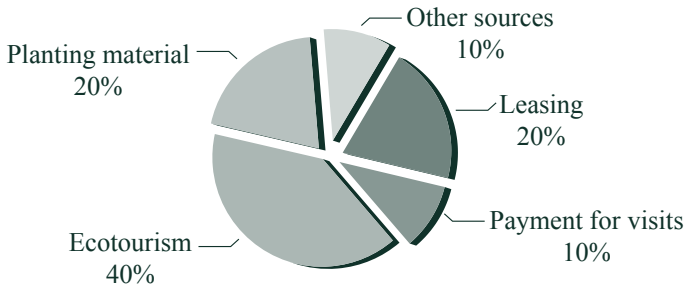


Figure 4.5. Pattern of special funds of nature parks



National nature parks can engage in economic activities within legal limits, consequently, they have a broader spectrum of financial sources, including organising mass tourism with the relevant infrastructure, leasing out land and pastures, plant and livestock breeding, etc.

SPNA directors noted the need to develop ecotourism, which plays an important role in forming special accounts and makes up 40-70% of special accounts. However, according to survey respondents it should be approached carefully as tourism has negative effects on the natural ecosystems.

Different forums are of course good for publicity, attracting investments and tourists, but for our reserves, for example, Son-Kul, they are simply destructive. I remember after one such forum in 2002 cars had made such a wide track that it will take 10 years for the grass to re-grow, therefore lots of tourists are not good for our countryside

Expert, Bishkek

Other financial sources of SPNA are the fines and penalties imposed by rangers and hunting experts, which despite the high level of poaching are very low.

During the survey researchers never once heard of rangers and hunting experts levying fines.

Payments by tourists are completely unrecorded in the SPNA – "rarely some tickets without a stamp are issued for the cinema", so this income is practically uncontrolled and does not reflect the real number of tourists and level of income received.

Payments received from the population (haymaking and wood) are not high, however experts believe that despite minimal tariffs there is no need to increase them – "you can't take from the population", they think.

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According to experts not all special resources are accumulated in special accounts as the "regional state administrations fight tooth-and-nail to get into the pockets of reserves". Almost all SPNA fulfill their mission to entertain all sorts of guests and inspecting and controlling bodies of different levels. As a result the management of SPNA does not have to transfer all special funds to special accounts. Unregistered funds are used to organise receptions, dinners and guest services and in a number of cases, for the needs of the regional state administrations.

In practice SPNA don't show all funds received from economic activity and transfer approximately 40-50% of them to special accounts. All unregistered funds are spent not on developing SPNA but for departmental and personal purposes of the SPNA leadership, higher level organisations and local governments and this suits everyone and so nobody is interested in talking about or changing this situation.

SPNA staff Djalal - Abad province

You have seen how many Jeeps there were yesterday, all of them belong to important people from the regional and oblast administrations. I, for example, was busy serving guests all day and didn't even have time to work. Sometimes it annoys me so much: why should I, a qualified specialist have to meet guests and then get a headache thinking of how to write off the cost

Survey respondent, Djalai - Abad oblast

Experts have made the following proposals to improve the situation with special accounts:

- Improve the collection mechanisms of special funds (introduce cash registers, install closed circuit TV at posts, etc.) and develop measures to increase the transparency of expenditures and introduce public control over special fund receipts and use;
- Ban special accounts at state level, and transfer all special funds to the republican budget and by reverse funding procedures allocate funding for environmental activities.
- Prohibit special accounts and send all special funds to the state environment agency, which should identify priorities and allocate them for environmental activities.

Representatives of government institutions have suggested that all funds received from international organizations for the environment should go into the state budget but not directly to the project executor. It is worth noting that under the existing centralization of authorities this would increase corruption and moreover lead to the closing down of independent NGOs.

On the whole the existing system of funding doesn't allow SPNA to fulfill their direct, lawful functions. According to experts funding of SPNA is below the permissible level. In the Issyk-Kul reserve, for example, no work is being carried out on registering wild animals and birds, which should be done as part of the commitments under the Ramsar Convention on Wetlands. All reserves have problems with shortage of funding to organise the winter feeding of animals, buildings are in decay and rangers and hunting experts are not properly equipped. Research is not being adequately carried out in most of the reserves and in some no research is being done at all.

Material and Technical Capacity

According to the survey data the technical capacity of different SPNA vary, depending on whether SPNA receive international grants and assistance or not. Those which get international support have higher material and technical capacities, for example, Sary-Chelek Reserve, where several projects have been implemented. Thanks to the projects the museum and administration office have been repaired and rebuilt and a micro hydro-electricity station was built, which feeds the hotel and offices have been equipped with computers. The reserve's management is particularly proud of its radio communication system between all hunting experts and the office and with the external world – the region, oblast and capital. Thanks to the projects the reserve has been equipped with new special equipment, off road vehicles and boats. Most of the equipment is in working order and hunting experts here have been given better quality uniforms and shoes than others have.

In other SPNA, which have not had any additional financing, the material and technical base is poor: there is a shortage of land, water and snow transport (vehicles, horses); no communications equipment, which reduces the speed and efficiency of response and the safety of rangers and hunting experts; a shortage or lack of winter and summer uniforms and the existing equipment is outdated.

Almost all SPNA badly need equipment for research work; there are no binoculars and very few cameras and little laboratory equipment.

Reserves are in a very poor state, have very few staff and they do their work with great difficulty. Funding is below all possible allowed levels. A forest guard gets 500-600 soms monthly and given that they must ride around the reserves and the reserves cannot buy horses for hunting experts, the rangers are forced to engage in poaching, but the problem is not only with salaries but also with equipment and transport, etc.

Expert, Bishkek

How can we fight poaching on the lake when we have only a few old boats in which we can't catch poachers that drive modern motor boats, therefore the poachers feel they can avoid punishment and are becoming more impudent day by day.

Expert, Issyk-Kul province

We can't stop the large scale shooting of birds during migration as we are not equipped with boats, fuel, weapons or communications equipment. Poachers don't work alone and are in big groups and they have guns. What can I do with my bare hands?

Ranger, survey respondent, Issyk - Kul province

Human resources

As for human resources, experts believe that the "in many cases the professional level of SPNA directors is very low" and in a number of SPNA there have been frequent changes of directors and the principles for appointing new directors are not known to staff. Cases where deputy directors get promoted to director are rare exceptions. Analysis shows that the existing approach to human resources policy does not meet the principle of professional promotion so that today "no deputy director, research worker or forest ranger can even dream of becoming a director". This hinders the creation of a normal competitive environment both for SPNA staff and for the staff of the overall environmental protection system. The survey revealed that no director is interested in implementing of long-term environmental programmes because he/she is a "temporary worker who can be dismissed any day". Some directors "are not professionals, as even when they have the relevant education they have never worked a single day in forests or the environment before being appointed to their positions". One of the reserves is headed by a former village geography teacher who has no environmental or administrative training. According to experts employees of the republican environmental bodies rarely get promoted to SPNA directors.

The mess in the nature protection system at national level has led to chaos in the grass roots departments. Since 1999 when I started work in the Sary-Chelek Reserve, for example, I have seen 4 agencies and 7 directors of SPNA change and only two of them were specialists in nature protection. Some directors have worked for only 6-7 months, so do you think they cared about nature?

Survey repondent, Djalal - Abad province

In our SPNA no one can be confident he/she will keep their jobs and if they say anything wrong they will be dismissed immediately.

Expert, Bishkek

In the 6th year of its existence Issyk-Kul biosphere has changed 7 directors and the 7th that now runs it knows nothing about the area.

NGO Representative, Issyk-Kul province

SPNA are often managed by non-professionals, they have no knowledge and don't know the specifics of hoe reserves work and are not interested in nature conservation, therefore our SPNA has turned into a forestry business

Survey participant, Issyk-Kul province

All the directors of our SPNA are appointed from above, no one gets promoted. Our present director, for example, graduated from the forestry technical university10-12 years ago, worked as a teacher and then went into business and now he is a director of an SPNA, although he has never worked a single day in the environment

Survey respondent, Issyk-Kul province

Due to the high unemployment rate there are no vacancies in the SPNA. For residents of buffer zones it is good fortune if a member of the family gets a job in the SPNA as it means a guaranteed flow of material resources (salary, uniform, etc.) and the possibility of controlling access to the resources of the SPNA and getting an income.

During the interviews, SPNA workers said that they "received their job due to connections or relatives who are directors or senior specialists or bribed them". As a result not all employees are qualified. Overall, one third of SPNA workers have special training while two thirds are not specialists.

They say I hire only my relatives, but it is not so. As a matter of fact in a small village everyone is related to each other, so these rumors are spread by those who are envious of me

SPNA Director

Among hunting experts and rangers, for example, the majority (more than 70%) has no relevant/ education or training, moreover, in a number of SPNA, especially in new ones, staff have no training. According to experts, "often hunting experts and rangers are not only uninformed about the legislation in their work and cannot write minutes, they know very little about nature conservation and are totally environmentally insensitive!"
Workers with higher education are often senior specialists however, the survey showed that these specialists can only be found in old SPNA, whereas in newer SPNA, especially those established after the country gained its independence, there are no specialists with higher education at all.

In SPNA, where international projects have been implemented at various times, employees have undergone qualification upgrading courses in contrast to those SPNA where no projects have been implemented.

I have no education other than secondary school and work as a ranger. I had no special training. When I started work I was given the Code and taught to write out charge sheets. We don't have regular training. In staff meetings our director sometimes says what should be done to improve our work, but I have never heard of anyone who has been to the region, province or republican capital to upgrade their qualifications.

Survey respondent, Talas province

According to experts the employee training system in nature protection needs to be changed. Currently only three vocational schools train SPNA specialists – rangers. No higher education institutions train specialists to work in reserves and there are no specialised curricula for reserves, so there are no new qualified personnel and highly qualified staff members are getting old. Experts believe there is no qualification upgrading system for SPNA personnel and no regular educational and scientific conferences are organized and current projects don't cover upgrading qualifications.

Lack of responsibility for non-fulfillment of official functions

There is a lack of administrative punishment in Kyrgyzstan. Despite there being regulatory norms there are no strict criteria for assessing the performance of government officials, which is usually assessed subjectively by a superior officer. Non-fulfillment of official functions on nature protection, lack of professionalism, orders that worsened the state of the environment are not reasons for dismissing government officials from their jobs.

Currently officials get their salaries regardless of the results of their work. Market mechanisms should be introduced to finance officials: if the ministry is not working well – people working in it should not get their salaries. There was an attempt to introduce this in the energy ministry and it worked but then the management stopped it

Expert, Bishkek

According to experts, creating a powerful public control mechanism would be an important mechanism if it worked properly.

How to make an official to fulfill his/her functions? It is very easy. He/she should be publicly shamed. Everybody must work towards it; NGO, mass media, recognized experts, citizens. Letters and complaints should be sent to the President – he will have no choice but to fire such an official.

Expert, Bishkek

It is thought that most problems related to improving SPNA work in Kyrgyzstan will be solved only when there will be effective reforms of state governance and a change in Human Resources principles aimed at professional quality.

Scientific capacity
According to experts and directors in recent years the SPNA system has seen a constant decline in the number of workers and primarily research workers. Many SPNA have no vets, ornithologists or fish experts and bird death laboratories have been closed down. Consequently no work is being carried out on vaccinating animals and studying animal migration and there is no research data on the population and state of the flora and fauna. Experts believe that the lack of research data makes it impossible to identify the priorities of and developing SPNA.

At the same time experts believe that the existing research activity in SPNA doesn't meet modern standards and is based on outdated methods when each scientist studied only certain species of animals or plants, therefore "scientists study species but not ecosystems". Experts believe that research activity in SPNA should focus on an ecosystem approach.

Experts also think that the function of science is to study and save wildlife and nature but our scientists are engaged in spreading foreign species of flora and fauna in SPNA. In the Sary-Chelek Reserve, for example, scientists have planted two dozen foreign trees and a dozen different animals including American skunks and raccoons and red deer, instead of our maral have been released. All these prove the low scientific level of reserve workers.

Human pressure on SPNA
According to participants of FGD, in the last 3-5 years they have started using SPNA resources more often and in greater amounts. So, for example, the local population not so long ago started the practice of hunting badgers and boars and harvesting mushrooms. During the FGD participants said that they go hunting alone as they are aware that hunting in protected areas is illegal and they try not to be caught by rangers and forest officials for which they use special tricks, such as covering their tracks or going to the mouth of a river, etc.

Illegal logging of (highly valuable) walnut burls is more organised, which involves a whole group of specialised workers: an employer, hauliers and direct loggers of walnut burl. In the words of participants, the employers of people who take walnut burls are a few well-known figures in the province who have influential patrons. With the help of their contacts with officials they can freely export walnut burls. Today it is a flourishing business. Forestry officials do their best to counter this problem – last year a ranger was killed in an attempt to stop illegal loggers. The population believes that the situation with the illegal felling of walnut burls has stabilized. However, in the opinion of participants of FGD if a customer reappears then there will be many who wish to take part in it as it is profitable.

Residents of the buffer zone of Issyk-Kul state nature reserve told us that many of them hunt birds and go fishing and some of them go poaching.

According to FGD participants despite a ban on fishing tourists can always taste fish from Sary-Chelek Lake. The practice of violating the SPNA regime to please tourists and high-ranking guests is widespread here.

Participants in FGD reported that they freely enter radioactive zones to harvest nuts, fruit, berries and medicinal plants and to make hay because fencing around the radioactive zones has been destroyed and needs repairing, whilst respondents say this would not change the situation as "people will enter the radioactive zone anyway to collect nature's bounty". Whilst doing their work researchers could see with their own eyes livestock grazing in protected areas.

During discussions the researchers learned that in many cases poachers are not afraid of being caught because they are relatives or close friends of rangers, as the rangers are from the villages of the buffer zone and also because people believe that rangers and forestry officials are afraid to catch poachers thinking that "if I catch him he will catch me another day" because rangers also violate the regime. There

have been cases, according to respondents, when foresters have been beaten up by poachers for being "too active".

Recently a forester was beaten up because some days before he reported a poacher. He was hospitalized but has now been discharged and we don't know whether or not he will go back to work as he is still weak. Why population has to invade into SPNA. Because , there is no job but the are children you have to care about.

FGD with people in the buffer zone, Djalal -Abad province

On the whole, the population (80%) of the buffer zone is happy living close to an SPNA. Some respondents are pleased at being able to increase their income by using SPNA resources, others like the climate, clean environment and beautiful countryside where they can relax. Most people don't like leaving their home villages except young people, who want to continue their education and the unemployed. People living in the buffer villages of the Sary-Chelek Reserve think moving would deny them the opportunity to use SPNA resources, therefore most of them don't want to move, however, experts believe that the population will grow and so will the human pressure on SPNA, which is why this issue should resolved sooner or later.

A social survey showed that more than 2/3rds of respondents would like to be compensated by the government for living within the protected area and experiencing limitations. The value of this compensation varies from 3 to 10 thousand soms per family. Other respondents suggested organising field employment stations. Many participants are willing to work abroad – in Russia or Kazakhstan.

On the whole, given the state of the current development of the regions, people don't see any prospects of not using SPNA resources and are waiting for help from the government to address this issue.

Compensation for damage

Employees of Protected Areas told us the current compensation system is as follows: In accordance with the Forest Code of the KR, first a ranger draws up a report of the offence for the offender, which is then considered by either the regional prosecutor's office or regional court depending on the value of the compensation. The ranger reports to the region and is informed of the date of the trial, which he should then pass on to the offender. Usually an offender doesn't appear in court stating that he/she has no money for transport or sickness etc. while the ranger must go to the relevant bodies each time at his own expense as travel expenses to the regional centre are not budgeted for, but even if an offender appears in court it doesn't mean he would be obliged to pay compensation. During the survey, researchers were never told that prosecutor's offices and courts are guided by the Administrative Code in their decisions, the punishments in which are considerably lower (the amount of compensation is reduced 10 fold) and according to Protected Areas' employees, courts and prosecutor's offices are overloaded with work and are corrupt, therefore the date of the trial is usually delayed and offenders are not actually punished. For example, there was a case, when despite a ranger's report asking for 3,000 soms the offender paid only 300 soms. Similar cases encourage poachers as they can get away with paying little or no small compensation or avoid punishment altogether while it discourages rangers and foresters from conforming to the law. A big problem for rangers and foresters is lack of transport to remove confiscated property (fishing gear, guns, boats, chainsaws etc.).

Establishing new SPNA

Survey participants consider that new protected areas should be established in the republic as natural ecosystems, in their opinion, are the basis of human life and life on the planet. According to experts there are semi arid landscapes not included in protected areas that also need protection.

Protected areas should be extended to cover all ecosystems. We have 20 ecosystems in our country and all of them must be protected.

a chief SPNA ranger, Djalal - Abad province

However, participants noted that in establishing new SPNA different aspects should be considered as the interests of the local population in achieving set goals. According to some experts setting up the Sary-Tash and Karabuurinsky State Nature Reserves "caused more harm than good". For example, the main goal of the Sary-Tash Reserve was to save the snow leopard, but after the SPNA was set up the "Rangers organized illegal hunting for different animals including snow leopards, for money". As a result, according to experts, not a single leopard was found in the last survey – the leopard was extinct i.e. the reserve had failed to perform its duty.

Today, unfortunately, we have the following situation - the more rangers and forest officers there are, the worse it is for nature because every ranger allows his relatives or friends into his SPNA and they destroy it

a chief SPNA ranger, Talas province

The opinion has been voiced that SPNA have been created for the interests of a small group of government officials but not for the general population.

The Kyrgyz are a quiet people – we have a low self-consciousness and no one likes conflict. Some government officials take advantage of this. We had a leshoz (state forestry enterprise), which satisfied everybody except its director, who without explaining the reason to the people, collected their signatures and made the leshoz into an SPNA. The people understood everything but it was too late to prove anything.

FGD among the local population, Issuk - Kul province

SPNA borders

Unfounded and inaccurate borders of SPNA may lead to serious conflicts between the management of SPNA and the population of the buffer zones. These conflicts may entail political consequences and make people stand not only against the leadership of SPNA but also against the government. This problem exists in the Karabuurinsky State Nature Reserve.

The population stated that the Karabuurinsky SNR was established without considering the opinion of the majority of the population living in 9 villages of the buffer zone. As a result, pastures that the population had used for grazing their livestock for many years became part of the nature reserve. They didn't take into account that the people's main occupation there was grazing livestock.

Currently the population living in the buffer zone has automatically become poachers by illegally grazing their livestock on the SPNA and this "gives SPNA officials direct material benefits". So rangers turn a blind eye to illegal live-stock grazing for a certain sum of money. Such relations between reserve officials and the population of buffer zone has led to a worsening of the state of the reserve's pastures and mass discontent of the population, which threatens serious social consequences.

Residents are joining some social activists and making demands to the Governor of the oblast, SAEPF and the Prime Minister of the KR. The negative consequence of this is that people are forming a negative attitude to the reserve as a threat to lowering their material well- being and developing a tolerance to poaching.

The Governor supports us and here is the resolution where he states that the pastures must be given back to the population. That is why people didn't go to the rally. I have been to the SAEPF – they are ready to give us land where no grass grows, so how can one graze livestock there? If the problem is not solved people will rise up and go to Bishkek to hold protest meetings.

Activist, representative of the buffer zone, Issuk - Kul province

A rational and scientific approach to setting limits on SPNA is important for the biodiversity also. Thus the head of the Naryn State Reserve is sure that in the SPNA there have been no cases of hunting for maral and the reserve fully protects this Red Book listed animal. However, interviews with the population revealed that in certain periods the animals migrate to give birth outside the SPNA, where they are killed by hunters.

Animals don't know where the borders of SPNA are, they migrate according to their own laws.

FGD, resident of a buffer zone, Naryn province

Radioactive zones

Delimitation of radioactive zones is one of the important problems of SPNA activity, as there are cases when some SPNA of limited value are designated radioactive zones and these areas are used for livestock grazing, tourism and building hotels. In one SPNA the director was reluctant to show the radioactive zone of his SPNA. During the research it was assumed that the management of SPNA deliberately moves the radioactive zones to gain from exploiting natural resources.

Bosses of certain SPNA are in a rush to attract tourists and additional income and give them the most valuable parts of SPNA and even radioactive zones are shifted so that tourists get access to valuable sites.

SPNA worker, Issuk - Kul province

Experts believe it is necessary to take stock of the existing boundaries of radioactive zones and constantly monitor their state and increase the responsibility of SPNA bosses for the unjustified shifting of radioactive zones.

Livestock grazing

Livestock grazing is a real scourge for SPNA. Almost all the researchers saw livestock grazing in SPNA but all the bosses replied that grazing was permitted and completely legal in those areas. It should be noted that the research didn't aim to check the truthfulness of the information provided by SPNA however, responses given by other respondents contradict the bosses' responses. Ordinary people believe that grazing is possible only with the permission of SPNA bosses and very often these livestock belong to the SPNA bosses or the local authorities.

Have you been to a radioactive zone? Go and see, if you are allowed how intensively livestock is grazing there and even tourists don't want to walk on such large amounts of dung.

ranger, Issuk - Kul province

Organising tourism

According to the existing laws, tourists visiting SPNA should follow several rules that forbid the possession of hunting and fishing gear, disturbing or frightening and feeding of animals, picking flowers, fruit and berries and polluting the area. Tourists should follow the route and not create any disturbance. However, a survey of tourists showed they hadn't been informed about these rules when entering SPNA. At the entry post they paid money for each person and for their car and no receipts were given. They were offered such services as tasting lake fish and horse riding. The survey has shown that SPNA can be entered by showing a note from the SPNA, regional or village administration. For an additional payment tourists can enter any part of the SPNA. Tourists leave a lot of rubbish behind thus polluting the area and can park and cook anywhere they choose and play loud music. As a result, grasses in those places are destroyed and animals lose their habitats and go deep into the SPNA. Experts believe that in a number of SPNA rangers are only engaged in collecting the rubbish left by tourists.

A survey of rangers showed that the rules for tourist visits are not controlled in practice and with the current numbers of rangers and foresters SPNA are unable fulfill these tasks. Guides from among the local population are not interested in this work as tourists are a source of income for them. Moreover,

very often in order to get more profit guides offer exotic leisure pursuits, for example, tasting meals made from rare species of fish, birds or animals.

The problem of controlling tourist visits is especially important for SPNA located near big cities (Ala-Archa and Karakol State National Nature Parks) and widely-known reserves, such as Sary-Chelek, however people in other SPNA believe "everything is possible for dollars".

According to tourists, mountaineering huts are in a bad state of repair and therefore mountaineers don't stay in the huts but pitch their tents on the slopes of mountains and leave lots of rubbish around their tents.

When you climb up the glacier and look down you can see piles of empty tins, plastic bags and other rubbish. Foreign mountaineers are shocked by such sights and say they don't see this in other countries.

Tourist, Bishkek

According to the law SPNA bosses should provide special places for lighting fires and pitching tents that have wooden furniture and rubbish bins, however, as the research has shown, not all SPNA have such properly organised places. In a number of places the furniture is broken and needs repairing, toilets are not well-equipped and there are no rubbish bins.

In general all survey respondents agreed that it is necessary to strictly enforce the rules for tourists visiting SPNA.

Danger for rangers from poachers

As the research showed, rangers are not protected from poachers when carrying out their duties. When meeting a group of poachers felling trees or a hunter with a gun, a ranger is equipped only with a pen and has no communications equipment, transport or means of protection.

What can a ranger do? He only has a pen and paper in his hand, while poachers, often drunk, are aggressive and have guns.

FGD with the population of a buffer zone, Issuk - Kul province

A ranger is put in the situation where it is easier for him to make a deal with poachers than report them, therefore charge sheets are rarely written out.

I am not satisfied with the work of the rangers. They don't write out charge sheets and work badly

SPNA direktor, Issuk - Kul province

Corruption

According to independent experts, who deal with environmental protection structures in their everyday work, a corrupt pyramid has been formed in the system, which works for the material gain of its participants. As a result of this, the existing environmental regulatory basis virtually doesn't work. This pyramid doesn't accept specialists who don't meet its requirements and interests. According to experts in the environmental system all kinds of corruption exist – from domestic to systemic and at all levels from rangers to the SAEPF bosses.

My son grew up here and always dreamed of becoming a ranger. When he got a job at last he reported a neighbour for illegal grazing, which he then submitted to the SPNA management. Later an SPNA specialist came to our neighbour and said: "I'll put you in prison, if you don't give me a sheep". The neighbour gave him a sheep and now he is still grazing his livestock. My son wanted to ask the SAEPF to find out the truth. We, his parents, talked him into leaving his job. Now he works in Bishkek.

FGD with the population, Issuk - Kul province

Unfortunately, the "official machinery" that is called on to protect nature is not there to protect nature but for its own material benefit by using the natural resources, therefore this form of work is tortuous and will be the first to deplete nature whilst berating the public for its failure to protect it.

Expert, in-depth interview, Bishkek

Even project money from international organizations is spent by officials because the results on the quality of projects are accepted by the same officials.

Expert, Osh province

All the country is being robbed blind by officials, which is true of all CIS countries. Our country is like a private shop where the political leaders solve their private problems.

Expert, in-depth interview, Bishkek

Imperfect legislation

Experts believe that the existing environmental laws need updating in terms of the compliance of acts of different ministries and agencies. According to the Fisheries Department, for example, inspectors of the fish inspectorate can enter SPNA unhindered but this contradicts the law on SPNA, which states that the entry of unauthorised people to SPNA is prohibited. A similar situation exists with other controlling and law enforcement bodies – officers of internal affair bodies, prosecutor's offices and the courts are free to enter SPNA as they have higher status than rangers and foresters.

Many experts believe that internal legislation should be harmonized with international legislation. Their concept should be reviewed in order "to speak with the international community in one language". There were opinions that there is a need to strengthen the law on environmental monitoring, which should provide for public participation.

There is confusion about the law on SPNA. For biosphere areas one set of laws apply while the laws assume other laws apply. International legislation in the same area assumes something different.

Expert, Bishkek

Low level of environmental awareness

Experts believe that residents of buffer zones and Kyrgyz society in general have very low levels of environmental awareness, which should be raised. A big role in raising awareness of the role of ecosystems should be played by the mass media however according to experts on the contrary some reports in the mass media upset the population with stories of extremely expensive animal furs and birds of prey.

Today in the newspapers one can read stories about the high prices for falcons, snow leopard skins or walnut burl, whilst you never articles about anyone being punished for exporting or catching birds and animals. This makes the population think that nobody can be punished so when someone suggests they get involved they don't think about nature or making animals extinct and see only dollars

Expert, Bishkek

That is why experts believe that the mass media should pay more attention to raising environmental awareness, foster love and respect for the environment and publish reports focusing on the links between humans and wildlife. There should be reports on the work of hunting experts, which would tell people how they catch poachers and how they are punished. It was also suggested that hard-hitting social commercials should be run on TV and radio during the tourist season showing people what they leave behind them in SPNA and how it impacts city or community life. It was also suggested that high level officials be satirized relaxing in the countryside and their attitude to SPNA in order to reduce pressure on SPNA officials

SUMMARY

Data received during the research leads to the conclusion that SPNA should be improved as soon as possible by solving the following problems:

- Setting environmental priorities in the country's development and change the residual principle of SPNA financing;
- Reforming state governance at country and SAEPF level;
- Separate the controlling, supervisory and implementing functions of the SAEPF structure;
- Introduce a monitoring system into the SPNA system and indicators of the state of SPNA;
- Analyse the targeted use of funds and payments collected for spending on the environment;
- Stimulate the interest of executors at grassroots level by delegating functions to them on decision-making, planning, implementation, responsibility and expenditure of funds;
- Improve the material and technical base and scientific potential of SPNA;
- Upgrade the qualifications of the bosses and specialists of SPNA;
- Provide state support to the staff training system for SPNA;
- Draw up a responsibility mechanism for each participant of the Environment and Forestry system for non- or unsuccessful fulfillment of assigned responsibilities;
- Involve the public and mass media as much as possible in the nature protection process (decision-making, control, assessment of activity, expertise etc.);
- Set up effective coordination mechanisms to implement the UN Convention on Biological Diversity;
- Give wide coverage to nature protection and SPNA activity in the mass media including publishing revealed violations and court decisions on them;
- Raise the environmental awareness of the population and young people.

MEASURING WATER LEVEL CHANGES IN ISSYK-KUL LAKE

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INTRODUCTION

Issyk-Kul Lake is the largest and most unique water reservoir in the Kyrgyz Republic. It plays a significant role and hugely impacts the climate of the country and the lives and activities of the population. According to the renowned climate expert, A.I.Voyekov, "Closed lakes (with no outflows) are very important for climate studies since they serve as large measuring platforms of rain and evaporation processes, and thus, help to monitor large-scale changes in the water cycle in huge areas of the world." It is very important to study trends in water changes in the rivers that flow into the lake and in the lake itself, because these changes can lead to the swamping of some areas and aridity in others.

The aim of this work was to carry out a pre-project survey, part of which collected and summarized the opinion of the population and elderly residents in the focus villages on climate change, changes in the water levels in the rivers and in the lake, as well as their impact on the lives of ordinary villagers.

1. METHODOLOGY

The survey used qualitative and quantitative data collection methods. For the quantitative survey, the client selected six focus villages, where 160 respondents were randomly selected in each. Qualitative information was collected through in-depth interviews with elderly residents[1] and experts – heads of local self-government bodies, heads/members of Water User Associations (WUAs), and scientific workers. Five interviews with elderly residents and three expert interviews were conducted in each surveyed location. A total of 1,012 people were surveyed.

Criteria for selecting focus points by the Client:
1. Coverage of different natural and climate zones,
2. Presence of problems related to lack or excess of water that affects the lives and economic activities of the population,
3. Location near the lake and its rivers,
4. Size of the village.

Information on the study points is presented in the table below and in Figure 1.

Table 1.1. Survey areas

Rayon	Focus point	Issues
Ak-Suu	Teplokluchenka	Swamping, flooding, excess water
Issyk-Kul	Chyrpykty	Lack of water
Issyk-Kul	Orto-Oruktu	Frequent mud slides, soil erosion
Ton	Ton village	Presence of a large irrigation network
Ton	Taldy-Suu	Humidity, lack of land
Ak-Suu	Shapak	Swamps, large irrigation canal

Each point is unique and is unlike the others. The survey did not include an individual analysis of each village but covered the general population of all the survey points in order to present general trends in climate and water levels in Issyk-Kul Lake and its rivers.

[1] Eldery residents are residents living in surveyed areas more than 20 ears.

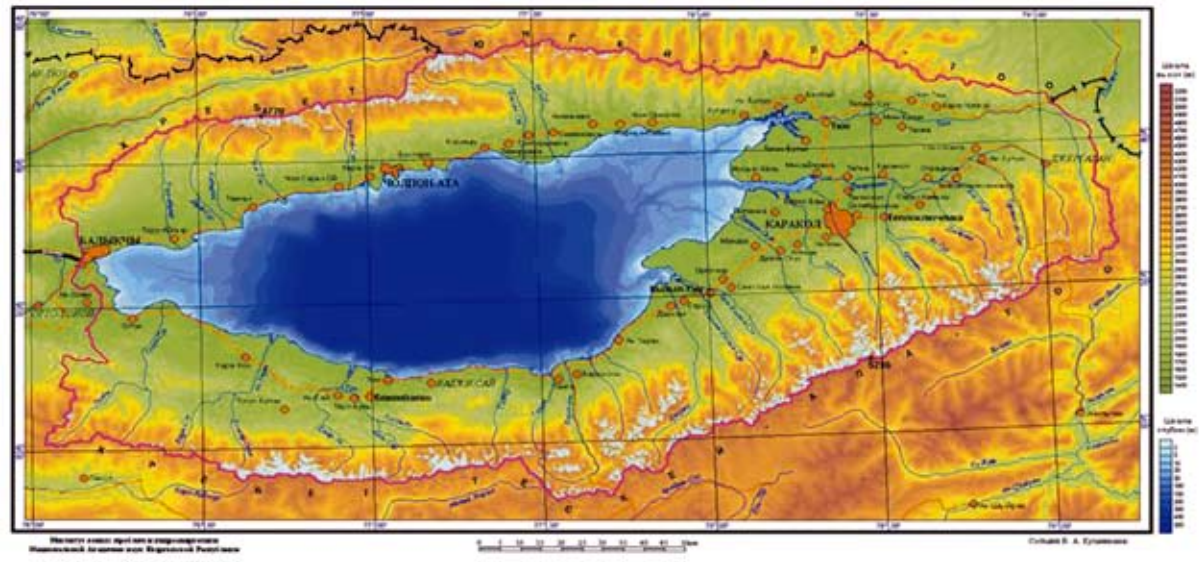
2. BRIEF OUTLINE OF THE SURVEYED LOCATIONS

Characteristics of the Issyk-Kul lake basin[2]

The elongated Issyk-Kul lake basin (Picture 2.1.) is limited by mountain ranges on all sides. The southern range - Teskei Ala-Too – stretches for 375 km from west to east and peaks at 5,216 metres (Kara-Kol Peak) among the upper Karakol and Djeti-Oguz rivers. To the west, the height of the range falls to 3,500 metres, and to the east – to 4,500 metres. The relative rise in the range along the lake is nearly 3000 metres. The Kungei Ala-Too range, which limits the basin from the north, is 280 km long. It reaches its maximum height at the 4,771 metre-high Chok-Tal Peak. To the west and east the height of the range declines to 3000 metres.

To the west, the Issyk-Kul basin connects to adjacent areas via the narrow Boom Gorge and to the east – through the Santash Pass that rises above the lake by only 400 metres.

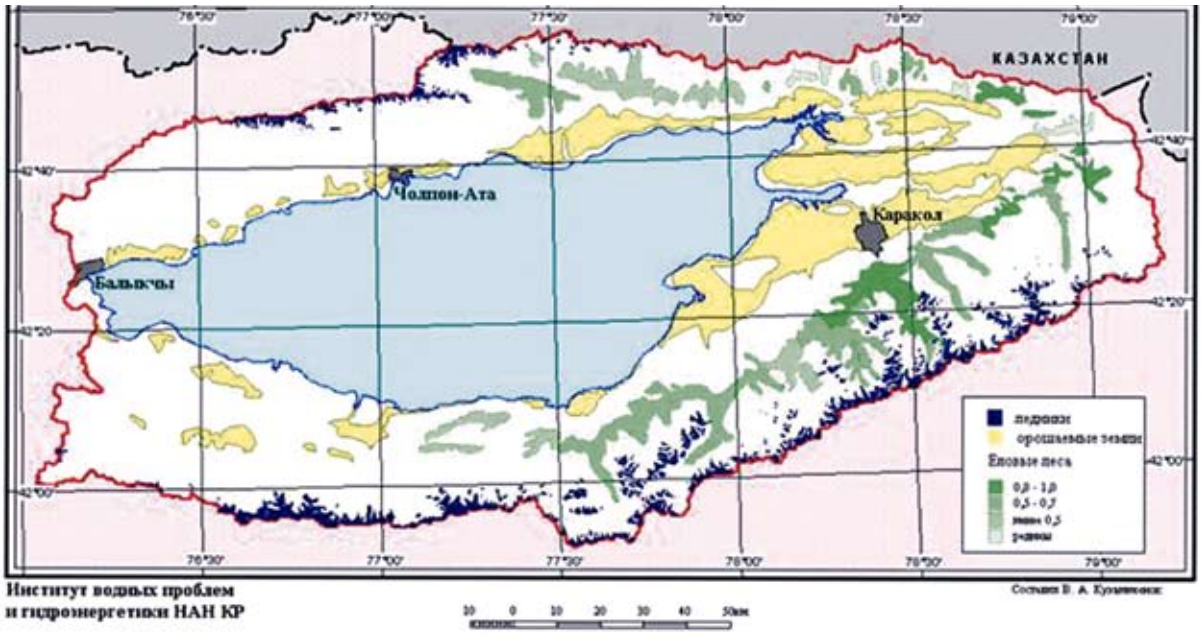
The area of the Issyk-Kul lake basin – which is 252 km long (latitude) and 146 km wide (longitude) - is 22,080 km2 of which the lake itself occupies 6,236 km2; the sub mountain valley, which is the zone for dispersing the river flow – 3,092 km2; and the remaining part of the basin (12,752 km2) is occupied by mountains where rivers are born.



Picture 2.1. Issyk-Kul lake basin

Glaciers of the basin accumulate nearly 48 km2 of fresh water - 15 times more than the annual flow of the rivers that feed Issyk-Kul Lake. The Dzher-Ui Glacier of the Ak-Sai River Basin is 7.3 km long but has an area of 8.7 km2. It is smaller than the Konur-Olen Glacier in the Ak-Terek River Basin, which is only 5.8 km long but has an area of 11 km2 (Picture 2.2).

2. All about the Issyk - Kul lake. Encyclopedic reference on nature and environment of the lake basin. Bishkek, 2005. p. 28.



Picture 2.2.

In the summer, clouds are usually concentrated along the mountain ranges that surround the lake and are formed due to the orographic lift of humid air along the mountain slopes. In winter there are two "windows" of little cloudiness – over the eastern and western parts of the lake – while the central part is covered by convection clouds. According to the data provided by M.I. Krivosheena and T.P. Gronskaya, in the shoreline zone of the lake, rainfall during the cold season (November – March) is 50 mm and during the warm season (April –October) – 240 mm. During the warm period of the year, the rainfall over the lake is 20% less than on the shore, while it is approximately the same during the cold period. The average multi-year coefficient of reduced precipitation at the lake is 0.85[3].

According to various authors, the number of rivers and temporary watercourses that flow into Issyk-Kul varies from 118 - 84. Due to the extraction of water for irrigation purposes only 30 rivers feed into the lake during the year[4].

The observed increase in the inflow of rivers into the basin occurs at the expense of centuries-old water reserves in glaciers. In the not so distant future climate warming could reduce the glacier cap that would lead to a sharp decline in summer water flows in the rivers. The threat of the lack of water in the summer is most probable for the sun-facing side of the southern slope of the Kungei Ala-Too range, where the glaciation area is small. This will have a negative impact on the lake and the agricultural area of the basin that depends on irrigated crop farming[5].

Climate of the Issyk-Kul Lake Basin[6]

The Issyk-Kul lake basin is noted for its complex climate conditions. There are four distinct areas that differ significantly from one another in terms of temperature, rainfall and other parameters. The western part of the basin has the least rainfall – some 100-15 mm a year. The least rainfall is noted during the cold season and in some years there is no rainfall at all, thus, there is no snow cover. When snow falls, it quickly melts. Some of the strongest western winds (ulan) of 40 m/sec have been recorded in this area. The northern shore is favourable for farming and the annual rainfall here reaches 300-350 mm. Most of the rain (up to 50%) falls in the summer (June-August). The least rainfall is observed in the winter months (December – February). The average duration of the frost-free period is approximately 180 days a year. The total volume of clouds in this area reaches a score of about 5 meteo numbers. The Southern shore has relatively mild winters – the same as on the northern shore and comparatively warm summers

3.
4. All about the Issyk - Kul lake. Encyclopedic reference on nature and
5. environment of the lake basin. Bishkek, 2005. p. 28.
6.

with adequate precipitation of up to 260-300 mm. Breezes and mountain-valley winds prevail in this area. The Eastern shore varies notably from other areas by its significant rainfall of 420 – 450 mm near the shore and 700-800 mm and more in the eastern mountain part. Winters here are snowier and the snow cover stays for nearly 110 days a year and the average duration of the frost-free period is about 145 days a year. Eastern winds prevail. The average temperature in July is about 16o and the absolute maximum was recorded at 35° C, while the minimum temperature drops to 22° C below zero. The total volume of clouds is scored at 5 meteo numbers.

Chyrpykty village, Issyk-Kul Rayon (district)
This village located at 1,680 metres above sea level in the western part of the Issyk-Kul lake basin has light precipitation – 150 mm a year. The distance from Issyk-Kul Lake ranges from 0.5 - 3 km. The average annual temperature is 7.3^0 C and the average temperature in January is 2.5° C below zero and in July is 18° C above zero. The village is bisected by the snow-fed Kabyrga River.

Ton village, Ton Rayon
This village 1,660 metres above sea level in the southern area of the Issyk-Kul lake basin has average annual precipitation of 130 mm. The distance from Issyk-Kul Lake is about 0.5 km. The annual temperature averages 7.3° C, the average temperature in January is 3° C below zero and in July is 18° C above zero. The village is by the groundwater–fed Keklik River.

Teplokluchenka village, Aksuu Rayon
This village 1,850 metres above sea level in the south-eastern part of the Issyk-Kul basin has average annual precipitation of 700 mm. The distance from Issyk-Kul Lake is 15 km. The annual temperature averages 5.6° C, the average temperature in January is 6.8° C below zero and in July is 18° C above zero. The village is bisected by the glacier/snow-fed Ak-Suu River.

Shapak village, Ak-Suu Rayon
This village 1,900 metres above sea level in the eastern part of the Issyk-Kul basin has average annual precipitation of 680 mm. The distance from Issyk-Kul Lake is 18 km. The annual temperature averages 5.5° C, the average temperature in January is 7.5° C below zero and in July is 18° C above zero. The village is bisected by the glacier/snow-fed Jergal River.

Orto-Oruktu village, Issyk-Kul Rayon
This village 1,720 metres above sea level in the northern part of the Issyk-Kul basin has average annual precipitation of 520 mm. The distance from Issyk-Kul Lake is 1.5 km. The annual temperature averages 6.5° C and the average temperature in January is 4.5° C below zero and in July is 18° C above zero. The village is bisected by the snow-glacier fed Orto-Oruktu River.

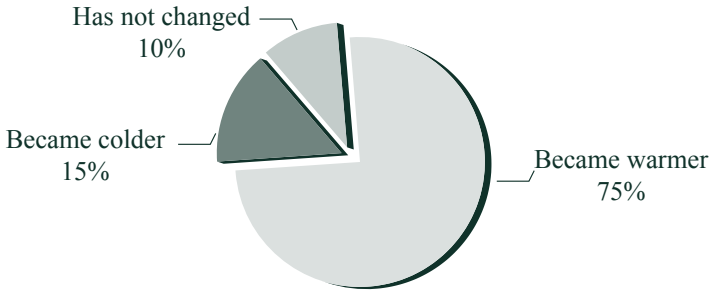
Taldy-Suu,Tyup Rayon
This village 1,900 metres above sea level in the north-eastern side of the Issyk-Kul basin has average annual precipitation of 700 mm. The distance from Issyk-Kul Lake is 12 km. The annual temperature averages 5.5° C, the average temperature in January is 7.5°C below zero and in July 18° C above zero. The village is bisected by the snow-fed Taldy-Suu River.

3. PERCEPTION OF CLIMATE CHANGE

To evaluate the problems of climate change in the area, all participants were asked a line of direct and indirect questions. The system of indirect characteristics of climate change included the duration of winter, presence of swamps, flooding, rainfall, dry and sunny days, mosquitoes, irrigation water, changes in water and wind erosion, watering of potatoes etc.

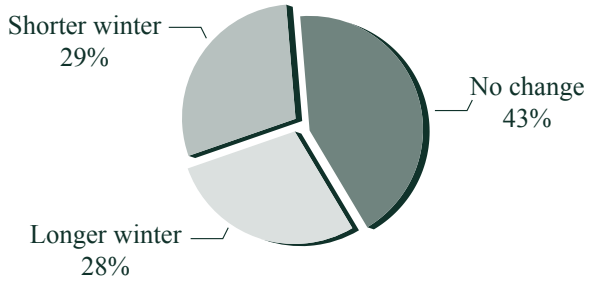
During the quantitative survey, most respondents (90%) noted that the climate has changed in the past 10 years. However, three out of four (75%) villagers noted that the climate had become warmer, while 15%[7] thought that it had become colder. At the same time one out of ten had not noticed any change in the climate (Figure 2.1.)

Figure 3.1. Perception of climate change by residents in the past 15 years



A survey of elderly residents confirmed climate warming in all the surveyed locations and they noted that the "winters had become warmer and February is especially warm and no longer has heavy frosts". Rising summer temperatures were also mentioned.
Many respondents (43%) said that winters had not grown longer. 29% of the surveyed villagers thought that winters had shortened and almost as many (28%) thought that winters had grown longer (Figure 2.2.).

Figure 3.2. Perceived winter duration in the past 15 years



Interesting differences are noted in the perception of respondents depending on location (Table 2.1). For instance, residents on the north-western part of the shore (Chyrpykty village) had not noticed any change in the duration of winter, while residents on the southern shore (Ton, Teplokluchenka) noted longer winters and respondents residing on the north-eastern part of the shore (Orto-Oruktu) thought that winters had grown shorter.

7. Half of respondents mentioned climate change lives in Teplokluchenko.

Table 3.1. Perception of the duration of winter in the past 15 year by surveyed location (%)

	Taldy-Suu	Ton	Chyrpykty	Teplok-luchenka	Orto-Oruk-tu	Shapak
Duration has not changed	70	33	90	3	17	69
Winters have grown longer	27	57	7	50	0	30
Winters have grown shorter	3	10	3	43	83	1

The aggregate perception of climate change in the past 10 years shows that a significant percentage of respondents had noted an increase in the number of sunny days (83%) and dry days (86%) and also reduced rainfall (73%) (Table 2.2).

Table 3.2. Changes in the local climate in the past 10 years[8]

Change	Has remained unchanged	Increased	Decreased
Boggy soil	59	12	24
Waterlogging	65	14	18
Rainfall	18	9	73
Number of sunny days	11	83	4
Number of dry days	9	86	3
Number of mosquitoes	53	27	20
Volume of irrigation water	29	13	57
Water erosion	60	15	18
Wind erosion	63	31	4

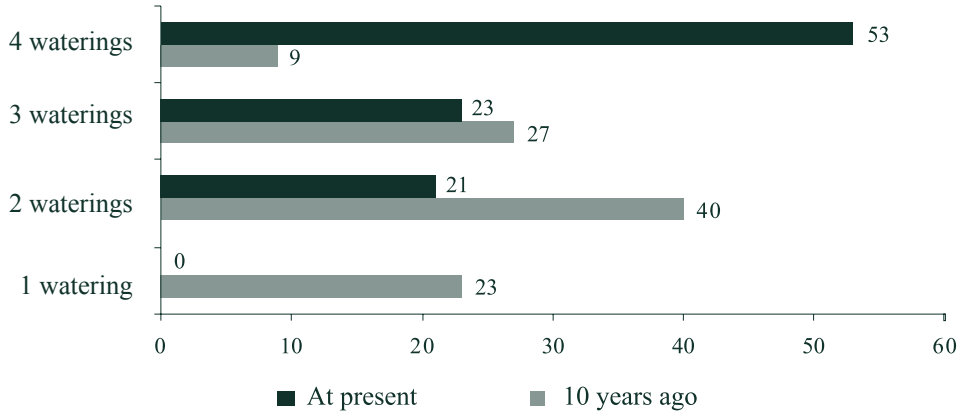
Residents of Chyrpykty village noted fewer mosquitoes.

According to the survey data, residents water their potatoes 1-4 times a season. A substantial minority of respondents (40%) water their potatoes only twice, one third – 3 times and one in five – once a season (Figure 3.3).

At the same time according to most respondents the level of land covered by swamps (59%) and flooding (65%) and water (60%) and wind erosion (63%) had remained unchanged. Nearly half of the respondents (53%) had not noticed any change in the number of mosquitoes. Most respondents who noted an increase in the number of mosquitoes lived on the eastern part of the lake (Teplokluchenka, Shapak, Taldy-Suu).

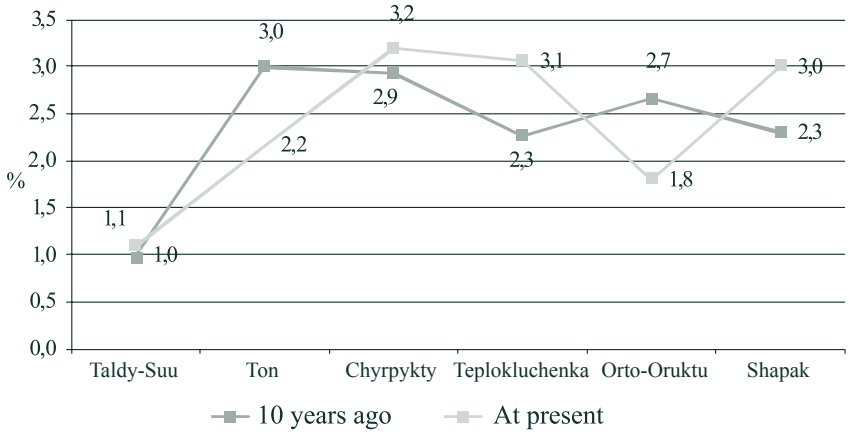
8. Data is considered without those who complicated to respond.

Figure 3.3. Information about the number of times potatoes are watered per season



The average number of times potatoes have been watered over the past 10 years has been falling: 10 years ago the average number was 2.37 and is currently 2.27

Figure 3.4. Average frequency of potato watering in surveyed locations



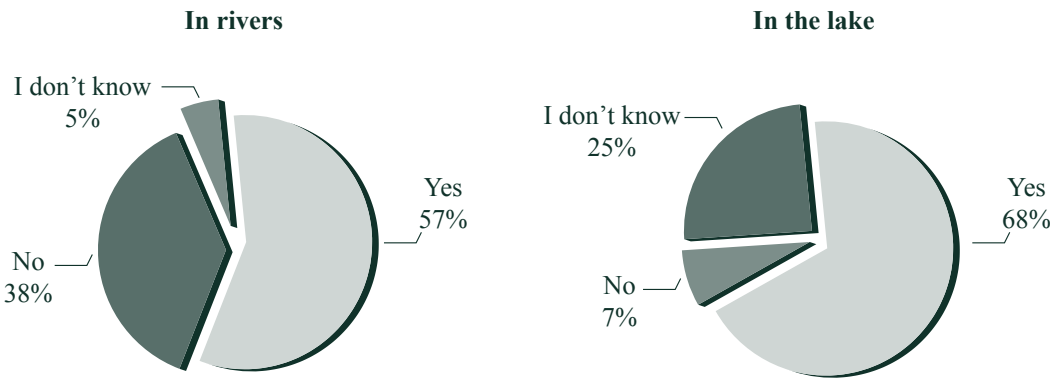
Only in Taldy-Suu village has the average frequency of watering potatoes not changed in the past 10 years (Figure 2.4). In Ton and Orto-Oruktu villages the average frequency of watering potatoes has fallen slightly, whilst in Chyrpykty, Teplokluchenka, and Shapak villages people have started to water their potatoes more often.

Two thirds of the respondents had noticed a reduction in water for irrigation purposes in the past 10 years and more than half of them (56%) are inclined to link this to climate warming. Among other reasons most frequently mentioned as affecting the reduction in the amount of water available for irrigation purposes, were inefficient use of irrigation water (21%), reduced precipitation (14%), and ineffective water management (7%). The factors of inefficient use of water included: degradation and destruction of irrigation networks, overuse of water for watering small plots and a lack of effective watering skills among farmers. According to experts, many inter-district, inter-farm and some intra-farm canals are out of order. One of the main reasons for the destruction of canals is lack of management and consequent mass stealing from water infrastructure. It was also noted that local authorities do not make sufficient effort to address the problem.
Respondents also mentioned a decline in the quality of drinking water due to the degradation of water supply systems and cacr of money for their repair.

4. SUBJECTIVE ASSESSMENT OF THE WATER LEVEL IN ISSYK-KUL LAKE AND ITS RIVERS

Opinions and statements made by survey participants help form the conclusion that the water level has been changing in the past ten years in Issyk-Kul Lake (68%) and its rivers (57%) (Figure 3.1). Overall, residents are more aware of the water level changes in the rivers than in the lake. This is supported by the fact that the number of those who had difficulties answering the question on perceived water level changes in the lake was five times higher than the number of those who couldn't adequately assess water level changes in the rivers.

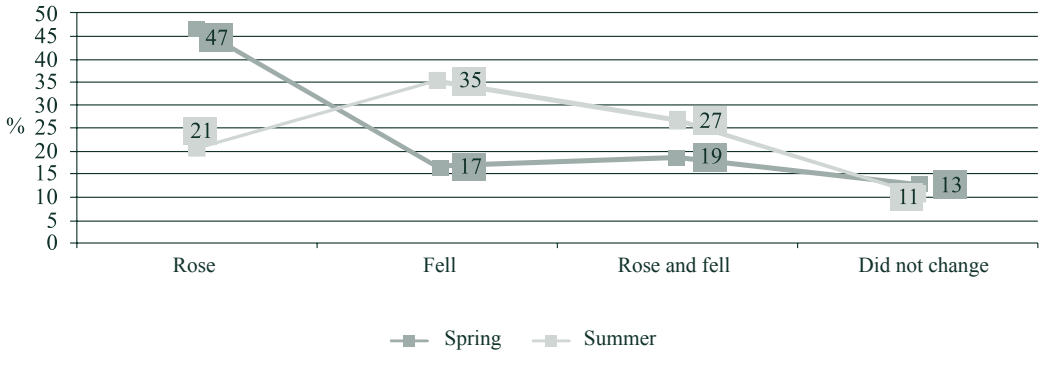
Figure 4.1. Subjective assessment of water level changes in Issyk-Kul Lake and its rivers



Analysis of responses through the prism of social characteristics showed that the higher the educational level, the more a person is able to assess the water level. Thus, 33-75% of those who could not answer these questions were respondents with incomplete secondary and secondary education. Analysis of answers in various survey points showed that village residents who live closer to the lake (Chyrpykty, Orto-Oruktu, Ton) are more sensitive to water level changes in Issyk-Kul, while those who live further away from the lake (Taldy-Suu, Teplokluchenka, Shapak) are more concerned with water level changes in the rivers.

A large minority of respondents mentioned that water in the rivers rises in the spring and falls in the summer (Figure 3.2.). Many respondents noted that the highest water levels in rivers are observed in the spring, when the snow starts to melt.

Figure 4.2. Type of change in water levels in the rivers in the past 10 years

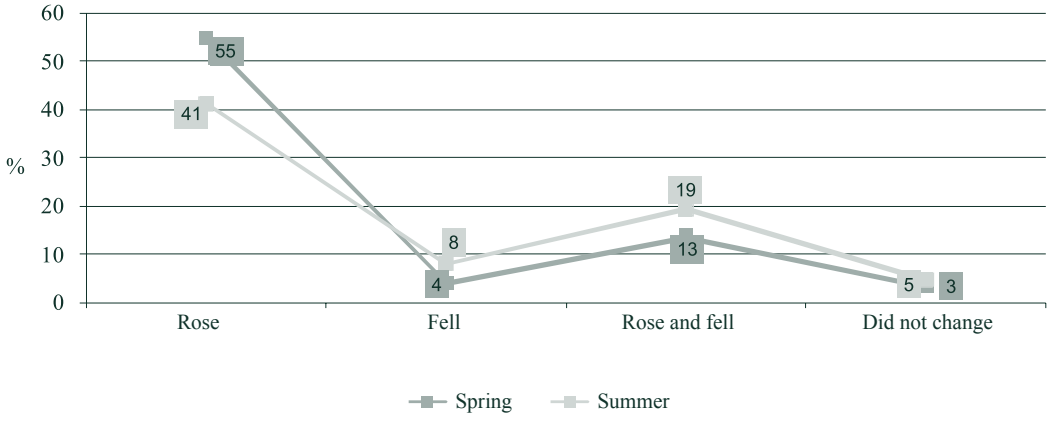


However, data analysis by surveyed locations showed that this is not the case everywhere. For instance, in the perception of respondents, water levels in glacier-fed rivers (Ton, Teplokluchenka) in the summer period rise, unlike in rivers that are fed from melting snow and summer rain (Chyrpykty) where water levels in the summer are low. This suggests that water level fluctuations in rivers are uneven: at some points water levels rise, while at others they drop.

More than half of the respondents (53%) were concerned with the summer drop in water levels in rivers and consider that this negatively affects people's lives, since rivers are not only the most important economic resource[9], but also sources of life for a significant percentage of the population, who use water from the rivers for drinking purposes.

A large minority of respondents says that water levels in the lake in the past 10 years have risen in the spring (55%) and summer (41%), whilst one out of five respondents said that in this period water levels in the lake had fluctuated up and down. The opinion that water levels in the lake have been steadily falling or have remained unchanged was mentioned only a few times (Figure 3.3.).

Figure 4.3. Type of changes in water levels in the lake in the past 10 years



Overall, it can be said with confidence that residents in surveyed villages have noticed that water levels in the lake have risen. However, in spite of this, most respondents are not bothered by this trend saying that such changes do not affect people's lives. This position could be explained by the fact that the water has risen "insignificantly" and accordingly "does not pose an immediate threat to their lives". At the same time it was noted that concerns regarding rising water levels in the near-the-shore villages was slightly higher than among residents who lived further away. To summarise, concern over the falling water levels in rivers is almost five times higher than concern over rising water levels in the lake, which indicates that reduced water levels in the rivers is a more important problem for locals.

The following conclusions were drawn based on the aggregate responses from all surveyed locations:

- Climate warming - more sunny days, a rise in average temperatures, less precipitation, warmer winters, especially warm temperatures in February – was noted at practically all surveyed locations;
- Respondents from the eastern part of Issyk-Kul Lake area are more concerned about excess water in the soil than respondents who live in other regions of the lake;
- Residents of the western part of the lake, more than others, are affected by aridity and lack of moisture;
- Water levels in rivers fed by precipitation (Chyrpykty) have been falling over the past 10 years, so residents of these villages have been experiencing a lack of irrigation water;
- Water levels in glacier-fed rivers rise in the summer and elderly residents report accelerated melting and degradation of glaciers;

9. The population benebits mainly from agriculture and growth of cattle.

- Water levels in Issyk-Kul Lake are rising and this is a bigger concern for residents of near-the-shore villages than for residents of villages located at a distance from the lake.
- Wind and water erosion, according to elderly residents, has not changed much.

5. OF PEOPLE IN FOCUS VILLAGES IMPACT OF CLIMATE CHANGE ON THE LIVES

Climate change

Generally, survey participants noted that climate change had been positive and favourably affected agriculture. Respondents from the central part of the shore (Ton, Orto-Oruktu) noted that their climate has become more favourable for farming. Elderly residents mentioned that destructive spring frosts occur rarely, warm summers were favourable for growing apples, apricots and pears and there was enough water for irrigation.

Residents of the eastern part of the shore (Teplokluchenka, Shapak, Taldy-Suu) noted the possibility of spring frosts and why it was favourable to grow frost-resistant crops such as raspberries, blackberries etc in this area. More frequent spring frosts will make gardening in this area riskier.

Adjusting to climate warming (reduced summer rainfall, higher aridity), residents in arid zones are forced to water vegetables such as potatoes and apricots, more frequently.

According to elderly residents of Chyrpykty village, climate warming has resulted in a higher demand for irrigation water, which is not met in the summer by water from the rivers alone. As a result, the village experiences the withering of apricots, wild apricots, poplar seedlings etc. To address the problem village residents suggested taking measures (water pumping stations, wells, etc.) to increase water supplies and expand the irrigated farming zone.

Impact of water level changes

The survey revealed that only one in five respondents (22%) thinks that water level changes in Issyk-Kul Lake will make life in the villages more difficult. Residents of near-the-shore villages are the ones who are most concerned with water level changes in the lake, whilst rising water levels in the lake create more worries than their fall. According to respondents, the damage from rising water levels will be more serious than from their fall. It should be noted that residents of villages further from the lake often had difficulties naming possible adverse effects from water level changes in the lake. Unlike them, residents of the near-the-shore zone were more aware of the possible effects of water level changes in the lake. The most frequently mentioned impact scenarios are listed bellow:

- Erosion and flooding of the sandy beaches in the recreational area that will negatively affect income-generating activities from tourism and recreation;
- A rise in underground water levels in the lower part of the shore zone;
- Flooding of buildings and structures in the shore zone, especially those that are built from sun-dried mud bricks;
- Flooding of the shore flora, including sea-buckthorn bush, whose berries are gathered by residents to sell;
- Destruction of fauna habitats;
- Reduced agricultural land as a result of swamping; expansion of swamps.

To address the problem of rising water in the lake, survey participants suggested the following measures:

- Monitor water levels in Issyk-Kul Lake systematically;
- Develop special measures to control water levels in the lake. Possible measures included constructing a canal, through which excess water could be run off from the lake.

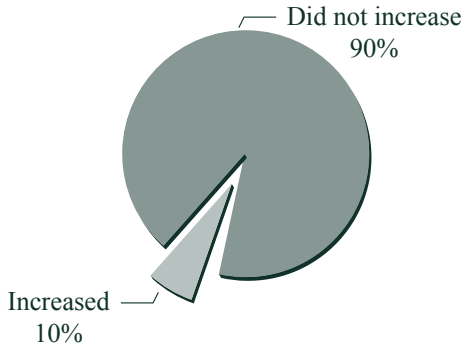
Residents of the villages located further from the lake are more concerned with the changes in water levels in the rivers, which is why most respondents suggested that life will become more difficult if the water levels in the rivers fall (79%), or rise (61%). The main consequences of reduced water levels in rivers will be a lack of water for drinking and irrigation, less land for farming and livestock breeding, greater poverty and aggravated environmental and social problems.

The most frequently mentioned effect of water levels rising in rivers was increased flooding of land, erosion of fertile soil, land erosion, flooding of houses, deterioration of the environment and ecology and extinction of fauna.

Impact of mud slides

Almost all respondents (90%) said that the number of mudslides in the past 10 years has not increased, whilst one in ten thinks that mudslides have become more frequent and of those 85% live in Teplokluchenka village (Figure 4.1.).

Figure 5.1. Perception of the number of mudslides in the past 10 years



More often the increase in mudslides has been linked to climate warming (92%) and degradation of the ecological situation (8%). According to elderly residents, mudslides in the surveyed areas were quite rare, which is probably why 50% of respondents are not worried about difficulties related to mudslides. In spite of this, respondents are quite aware of the destructive consequences of mudslides such as the destruction of bridges, roads, mud accumulations and erosion of fertile soil, destruction of electricity transmission lines, houses, and soil erosion. To protect areas prone to mud slides survey participants suggested:

- Building reservoirs and dams and irrigation networks;
- Regularly studying water levels in rivers and the lake and forecasting natural disasters;
- Prohibiting construction in mudslide-prone areas.

Awareness of institutions and measures taken to prevent the impact of water level changes in rivers and Issyk-Kul Lake

The survey revealed that 90% of respondents were not aware of any institutions or measures having been taken to prevent the impact of water level changes in the rivers and Issyk-Kul Lake. Moreover, most of these respondents (80%) were sure that nothing had been done at all, whilst 10% of respondents suggested that these problems were being addressed by international institutions. However respondents could not recall the details of such institutions or measures. Thus, we can draw the conclusion that residents are not aware of the work carried out in this field by government agencies and international organizations.

6. PEOPLE'S OPINION OF THE WORK OF STATE AGENCIES RELATED TO CLIMATE CHANGE

According to survey participants, the state does not pay enough attention to preventing climate change and related changes in water levels in reservoirs. Moreover, experts say that the closure of weather stations in Issyk-Kul Province is evidence of the short-sightedness of the authorities and an underestimation of the role of the weather service in terms of forecasting natural disasters. Only three out of eight weather stations that functioned during the Soviet times still remain and those that have closed down include the Przhevalskaya station that has been recording weather changes since 1875. As a result of such changes, weather observations in the eastern part of the lake – where respondents have noted the highest rise in water levels in rivers – are missing. A major loss was the closure of Chon-Kyzyl-Suu weather station that operated at an altitude of 1,550 metres. Scientists claim that forecasting and calculating possible impacts caused by climate change should be based on the data generated by weather stations. Some experts suggested that hydrological forecasts based on reduced, fragmented weather data can cause errors in calculations that could invalidate the whole forecast.

Residents and experts are of the opinion that "neither the local authorities represented by aiyl okmotu, nor provincial authorities, nor the Ministry of Emergencies have sufficient resources to take timely and effective measures in case of drastic and sharp climate changes or significant changes in water levels in rivers and Issyk-Kul Lake". Realizing their vulnerability in the face of natural calamities, most people in the surveyed villages (65-70%) think that the state should undertake certain measures however ordinary villagers do not have sufficient knowledge of what concrete actions should be taken so the number of those who had difficulties answering the question on preventing the impact of water level changes in the lake was 77%, and in rivers - 40%.

The following measures were mentioned most frequently in relation to rising water levels in rivers and the lake:

- Construction of dams, canals, widening of river beds;
- Increase forest areas, planting of trees;
- Resettlement of people from danger zones;
- Reinforcement of roads and bridges;
- Banning building near rivers and the lake.

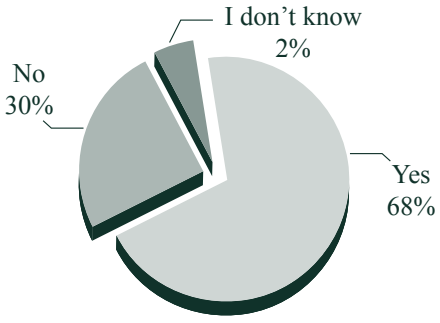
Experts noted that warming threatens people's prosperity, particularly in poor and vulnerable communities. Therefore in order to draw people's attention to the problem of changing water levels in rivers and Issyk-Kul Lake, it is necessary that all stakeholders – starting from aiyl okmotu up to provincial and national decision-makers (Government, Jogorku Kenesh) level – realise there is a problem. At aiyl okmotu level it was proposed to aim at social and economic development and planning, to conduct workshops on actions that need to be taken in the conditions of changing water levels in reservoirs, help develop preventive measures, provide equipment and financial support to renovate irrigation systems and render assistance to those worst affected. It is necessary to develop a programme that would include restoring weather services, improve agriculture and construct canals to collect water from the lake in emergencies and offset up a reserve fund to help Issyk-Kul residents etc. and to use it for the best investment and production decisions, taking into consideration the risks to Issyk-Kul province in the country's and region's strategic development.

According to experts, it is important to inform the local population about possible difficulties in their lives in the event of climate change and changes in water levels in reservoirs. It was proposed that scientists, economists, climatologists and specialists in the environment protection area carry out studies and research on climate change and water level changes in rivers and Issyk-Kul Lake. The importance

of creating a favourable environment for participation in addressing the problems by wider groups of participants was also mentioned. They could:

- Work with residents at all levels, training people in business planning skills, planting trees and participate in building canals using the ashar (community activity) method;
- Work with representatives of the private sector in the area of tax concessions and preferential loans for those developing and implementing adaptation measures;
- Work with NGOs, communities and religious leaders who could explain the problem more broadly;
- Work with international organizations to attract external investments in technical equipment, technological assistance and methodological aid and conduct research in this sphere and develop recommendations for the Government, provincial and rayon administrations.

Figure 6.1. Would you like to take part in activities to prevent the impact of rising water levels in rivers and Issyk-Kul Lake?



It is important to note that 68% of respondents expressed their readiness to take part in activities to prevent changes in water levels in rivers and the lake. For this work it was also suggested to engage NGOs (22%), international organizations (17%), local businessmen (14%), jamaats (local self-help groups) (6%), mosques and churches (2%).

7. BRIEF CHARACTERISTICS OF HOUSEHOLDS

Socio-demographic characteristics of respondents

48% of questionnaires were filled out by men and 52% by women. The majority of respondents (70%) were officially married, 9% were in an unregistered marriage, 13% were widows/widowers, about 5% were single and 3% divorced. Age and educational characteristics are shown in Figures 6.1 and 6.2.

Figure 7.1. Age of respondents, years

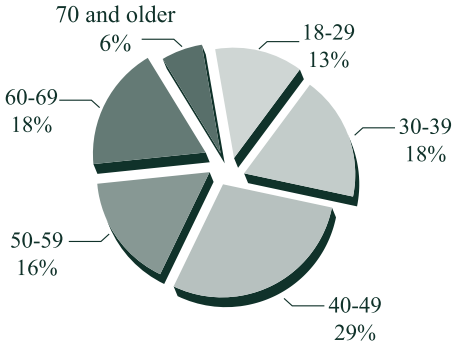


Figure 7.2. Educational status of respondents

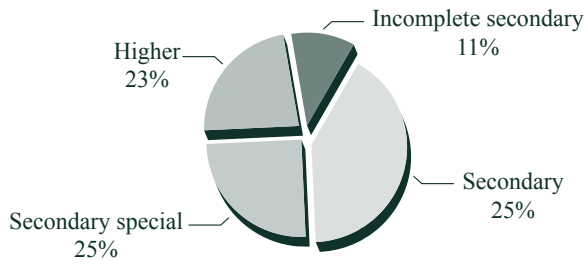
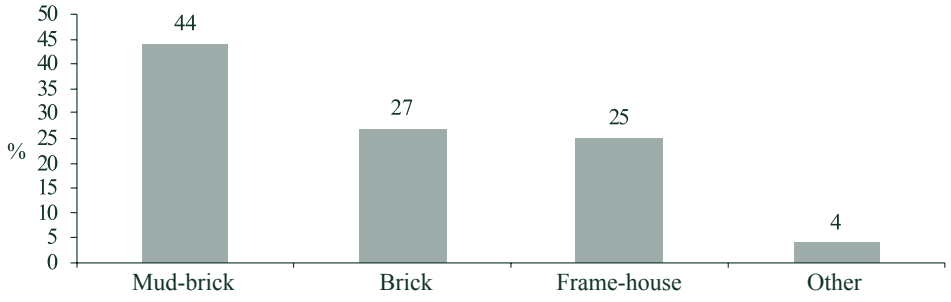


Figure 7.3. Type of dwelling

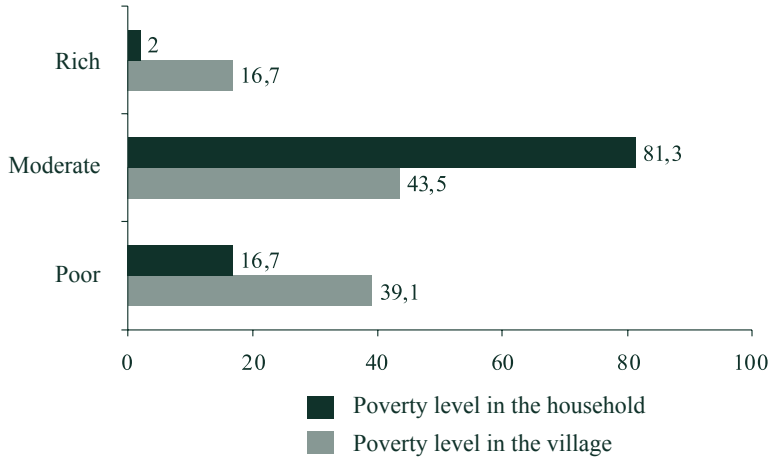


According to the survey, most respondents (44%) live in mud-brick houses that are quite dangerous in the event of flooding. Nearly one in three (27%) live in brick houses and a quarter (25%) in frame houses (Figure 6.3.).

Subjective poverty evaluation

On average, according to respondents, the poverty rate in survey points is 39.1%. However, when evaluating the poverty level of their own households, respondents often considered themselves moderately poor, thus, the subjective poverty rate has declined somewhat (Figure 6.4).

Figure 7.4. Average subjective perception of status (%)



Analysis of average data on household expenditures showed that in the perception of respondents from poor families, per capita expenditures amount to around 649 soms per month, in moderately poor families – 1856.6 soms and in rich families – 6,722 soms.

Household's dependence on climate conditions

The main source of income in focus points was farming, livestock breeding and gardening, which is why the dependence level of residents on climate change is significant. The following statements by elderly residents support this:

- Harvesting winter crops depends on the amount of snowfall that is reducing every year
- If there will not be enough water in the rivers, we will have no water for irrigation and harvests will dwindle
- If there will not be much snow and rain, pastures will dry out and there will be no fodder for the livestock
- If the lake erodes the beaches, few tourists will come, residents in the resort-recreational zone will become poor and we will have nowhere to sell fruit and cannot support our families.

SUMMARY

The following findings were made in the course of the household study:

- Principal sources of income in focus points - farming, livestock breeding, and gardening – presuppose a high level of people's dependence on climate change.
- Respondents think that the prosperity of people significantly depends on water levels in the rivers and most of the people are engaged in farming that needs irrigation. According to respondents, the material wellbeing of villagers depends more on the water levels in the rivers than in Issyk-Kul Lake, however, this was due to most of the surveyed locations being located far from the lake.
- Climate warming was noted in all surveyed locations and is manifested in more sunny days, higher average temperatures, less precipitation and warmer winters with warmer temperatures particularly being noted in February.
- Respondents in the eastern part of Issyk-Kul Lake are more concerned with excess water in the soil than respondents in other parts of the lake area.
- Residents of the western part of the lake suffer from aridity and lack of water more than residents of other areas.
- Water levels in rivers that are precipitation-fed (Chyrpykty village) have been falling in summer in the past 10 years resulting in villagers experiencing problems related to lack of irrigation water.
- Residents explain lower water levels in the rivers by reduced precipitation and excessive and inefficient use of water for irrigation.
- Water levels in the rivers that are glacier-fed rise in the summer and elderly residents have noted acc elerated melting and degradation of glaciers.
- Water levels in Issyk-Kul Lake have been rising in the past 10 years, which is a cause of concern for residents of near-the-shore villages, rather than residents of villages located at a distance from the lake.
- Wind and water erosion and the number of mosquitoes, in the perception of respondents, have not changed in the past 10 years.
- Residents of the surveyed villages have not devised strategies for addressing the impact of climate change, or changes in the water levels in the rivers and Issyk-Kul Lake and have never been involved in the process of their development. The most popular response to climate warming is increased irrigation of agricultural crops.
- It was suggested that water levels be constantly monitored in the reservoirs of the region for the timely prevention of the dangerous impact of higher water levels in the rivers and Issyk-Kul Lake.
- To increase the accuracy of data and the possibility of long-term forecasting it was suggested ways be found to reopen weather stations. According to experts, it is extremely important to reopen the Prezhevalsk and Chon-Kyzyl-Suu weather stations.
- Possible activities to reduce water levels in the lake in emergencies included building a canal for discharging water.
- Residents are not aware of activities of the state and international organizations that deal with reducing the impact of water level changes in Issyk-Kul Lake and its rivers.
- In the perception of respondents, neither local authorities, nor regional state administrations and the Ministry of Emergency Situations have sufficient resources to take effective measures in the event of drastic climate changes and significant changes in water levels in Issyk-Kul Lake and its rivers.
- Respondents think that addressing the problem of changes in the climate, water resources and water levels in Issyk-Kul Lake and its rivers should be included in the list of national priorities. This area of activities should also involve the business sector, NGOs, and the international community. National level activities with each participant or stakeholder have to be carried out systematically considering inter-sectoral and inter-agency significance and the involvement of local governance administrations and local communities.
- Most people (68%) are ready to take part in activities to alleviate or prevent possible consequences of climate change and water levels in Issyk-Kul Lake and its rivers to preserve them for future generations.

INCREASING THE ENERGY EFFICIENCY OF HEATING AND ENERGY CONSERVATION OF BUILDINGS

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INTRODUCTION

Heat and energy efficiency of buildings is a major issue that is receiving a lot of attention from many international organizations and solving it is closely related to the sustainable development of countries and of the world community as a whole.

Heat and energy conservation in Kyrgyzstan is considered a significant economic and social development issue but is yet to become part of state policy, therefore, almost all projects implemented in this area have been initiated and funded by international, donor and foreign organizations under international cooperation programmes. As part of the expansion of UNDP activities in Kyrgyzstan in the field of heat and energy conservation and efficiency, the UNDP Capacity Building and Environmental Governance Strengthening for Sustainable Development project commissioned a survey to analyse households in order to establish the baseline situation and define project needs.

The overall aim was to study households, carry out a qualitative assessment of the pre-project situation and define project needs in order to increase energy efficiency and heat and energy conservation in households.

1. METHODOLOGY

A working group comprising stakeholders from state, non-governmental and international organizations was established to develop and design the survey and it worked closely on all phases of the survey - drawing up survey tools and sites and identifying experts for interviews.

The study covered seven large cities and towns of the Kyrgyz Republic that are experiencing problems in the area of electricity supply and energy conservation. Although each locality is unique and has special problems of electricity supply, the aim of the survey was to reveal general trends in energy conservation.

Table 1.1. Survey sites

Region	Survey locations
Bishkek	Bishkek
Chui	Kara-Balta
Osh	Osh
Naryn	Naryn
Talas	Talas
Jalal-Abad	Tash-Kumyr
Issyk-Kul	Karakol
Total	7

Target groups of the survey:

- People residing in cities and towns, living in blocks of flats and individual home owners.
- Enterprises: representatives of organisations (chief electricians and others) well aware of the problems of energy consumption in organisations.
- Experts: specialists working in fields relevant to the survey (staff of municipalities and municipal services; government institutions; private enterprises and businesses interested in energy consumption, heating, and energy conservation; the Thermal Electric Power Station and other stakeholders).

The methodology combined both quantitative and qualitative methods.

- A quantitative survey of the population in the selected cities and towns.
- Survey of experts (interviews) – staff of municipalities and municipal services; government bodies; private enterprises and businesses interested in issues of energy conservation and consumption and heating.

Three tools were developed for the survey:

- Questionnaire for the general population,
- Questionnaire for enterprises, and
- Questionnaire for experts.

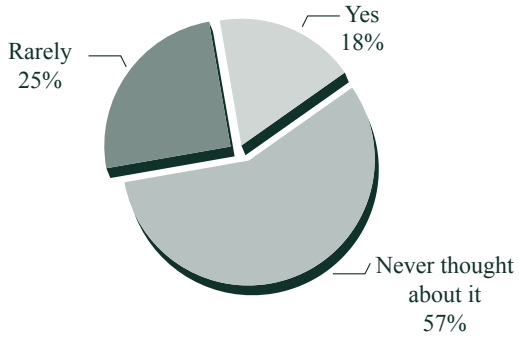
A total of 1,589 people were surveyed.

2. HEAT AND ENERGY CONSERVATION IN HOUSEHOLDS

Respondents' awareness of heat and energy conservation issues

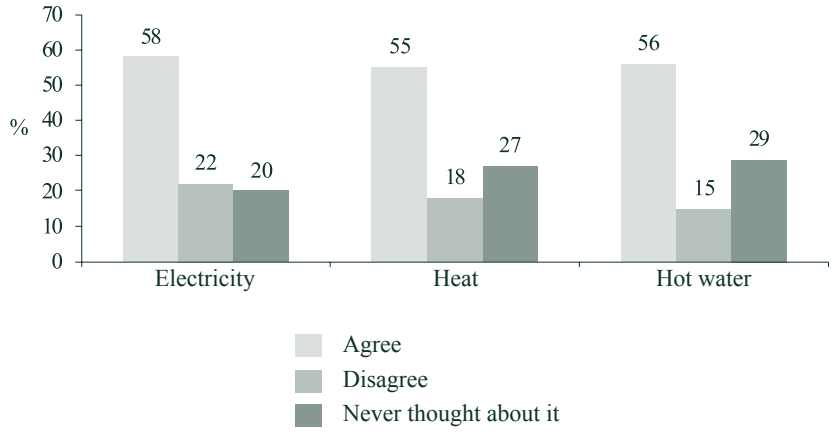
The study revealed that people in general give very little thought to the issue of energy resource depletion and the development of new sources of energy. Only 20% of respondents said that depletion of oil, natural gas, and coal resources would lead to problems with energy supplies whilst more than half of the respondents (57%) never thought about resource depletion, while a quarter (25%) are occasionally concerned about this problem.

Figure 2.1. Have you ever given a thought to the problem of depleting energy resources (oil, natural gas, coal) and ensuing problems with energy supplies?



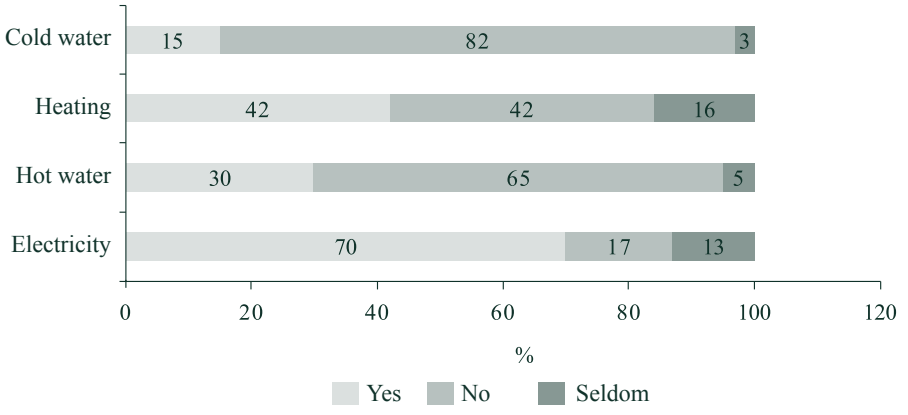
There is practically no statistical difference in the answers of respondents living in different cities. Data show that 15-22% of respondents do not think that producing electricity, heating or hot water harms the environment and 20-29% have never thought about it (Figure 2.2.). These numbers indicate the low environmental awareness of respondents who do not realize that the municipal utilities that they consume negatively affect the environment.

Figure 2.2. Do you think or know that the production of electricity, heating energy, and hot water for city residents negatively affects the environment?



Analysis of the answers shows that respondents care very little about saving water, electricity or heat, in particular cold and hot water and heat – 42 - 85% of respondents do not care about saving these energy resources. Respondents are most concerned with saving electricity, which, according to them, has to do with the fact that electricity consumption is metered in the majority of houses.

Figure 2.3. Are you concerned about saving the following resources?

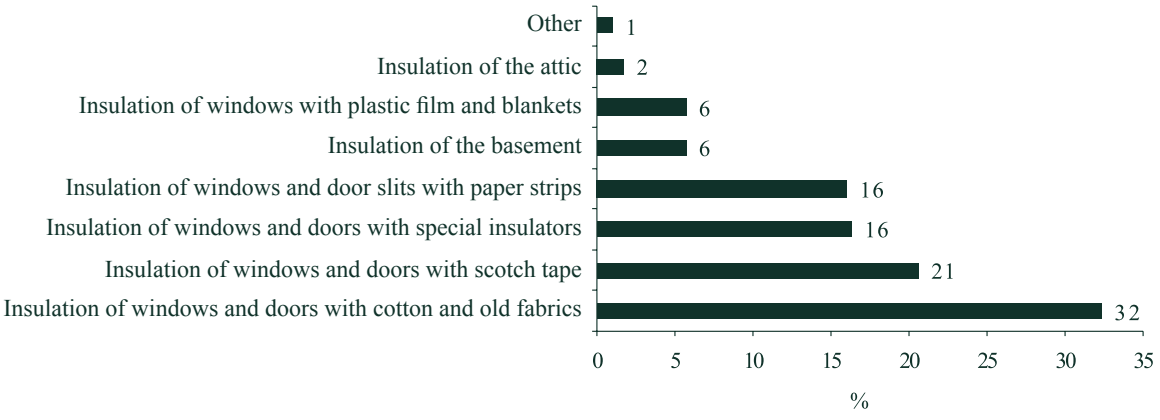


In-depth analysis of these issues in focus group discussions is divided into various criteria: type of dwelling (block of flats/private home owners), kind of heating (centralized/ individual) and type of hot and cold water supply (centralized/ individual) helped draw the following conclusions:

- Respondents are more concerned about saving the money, which is spent on these resources than saving energy resources themselves. In other words, participants first of all worry about reducing their expenses and only then about depleting energy resources.
- Less well-off respondents care about saving energy to a greater degree than more well-off respondents. Families that do not pay for the consumed energy in full, using state benefits or through informal relations with inspectors try to save money when paying for power.
- Inhabitants of blocks of flats with a centralized hot water supply and a single meter for the whole block are also not very bothered about saving hot water, whilst private home owners who generate hot water at their own expense always care about saving hot water.
- Neither inhabitants of private homes or blocks of flats care much about saving cold water.
- Almost all respondents care about saving heat.

The data produced by the quantitative survey confirmed the above-mentioned practices. 88% of respondents save and conserve heat by various means. Residents of private houses (90.4%) and blocks of flats constructed during the Soviet period (90.3%) care about saving heat more than inhabitants of elite recently built houses (71%). Participants in focus group discussions explained these differences by noting that "inhabitants of elite houses do not have to bother with saving heat because the issue was thought of when they were being built - windows are double-glazed, roofs are insulated with modern materials and efficient heating systems installed."

Figure 2.4. Ways and means of conserving heat:

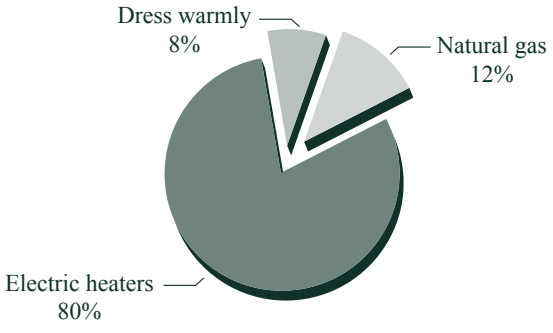


The ways and means of preserving heat show (Figure 2.4.) that respondents put most effort (90%) into insulating windows and doors with obsolete but quite effective methods - cotton wool strips, rags and blankets (54%), but in some cases the effectiveness of the materials used is quite low – gluing them up with sticky tape and paper strips (37%). At the same time the attic and basement are very seldom insulated – together accounting for no more than 8% of responses.

According to the survey[1] a traditional multi-storey block of flats loses up to 40% of its heat through the walls, 18% through the windows, 10% through the basement, 18% through the roof, and 14% through the ventilation system. It is clear that respondents underestimate the amount of heat lost therefore, heat conservation efforts are not effective enough. However, it is important to emphasize that owners of individual flats can do little in terms of insulating walls or changing ventilation systems. Such measures, according to experts, should be the concern of the housing and utilities services, management, associations of house owners and other associations.

A survey of city residents has revealed that when central heating radiators produce insufficient heat 80% of respondents use additional electric heaters, 12% use gas, and 8% simply dress up more warmly (Figure 2.5.).

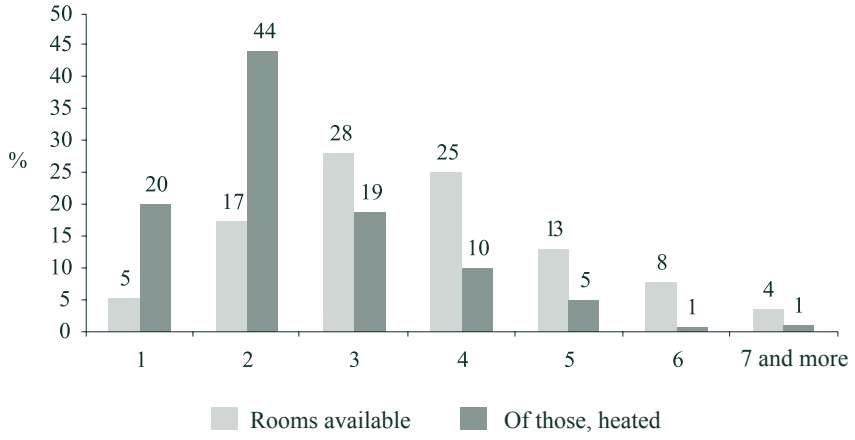
Figure 2.5. If central heating radiators produce insufficient heat how do you get warm?



[1] http://www.gas-journal.ru/Images/UploadFiles/2006-08/6-06-3.pdf

Focus group discussions showed that the type of electric heaters used depends on the living standards of respondents. Better-off city residents often use modern oil heaters, hot air heaters, electric blankets, closed spiral and air humidifiers. Less well-off respondents use old Soviet-type heaters, electric rings with open spiral elements and heat bricks on gas cookers.
Another widespread way of fighting cold is for a family to move into one or two of the best heated rooms in the house. According to the survey nearly 42% of respondents heat few rooms in winter and focus group discussions showed that this situation is widespread in small towns.

Figure 2.6. Data on the total number of available rooms and rooms actually heated



In general the survey showed that respondents are insufficiently aware of modern heat conservation techniques, effective types of energy, or energy efficient living practices. Focus group discussions revealed very few statements on this subject.

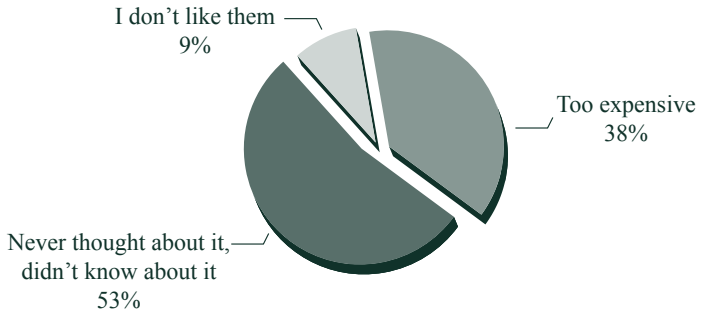
According to the survey, none of the respondents living in a house with central heating has a contract for receiving it moreover, none of the surveyed respondents was aware of the heat supplier's obligations. Practically nobody knows what temperature should be maintained in the heaters, how the heat is accounted for and so on. Many focus group participants said that heat is connected step by step, one district after another, but payment for the heating starts from the date the first house in the city is connected. Cases were mentioned where the central heating had been disconnected for up to ten days due to system failures, but charges were still levied for those days. Respondents blame gaps in the current legislation that allow such situations. On the whole, many respondents feel deceived when comparing the amount paid and quality of heat received.

Focus group participants consider fixing taps and eliminating overflows in toilets as the main way of saving hot and cold water. It was noted that the internal water supply infrastructure in many flats is in an extremely poor state however, tenants are not in a rush to repair it. The results of questioning showed that the reasons for this situation are: poor living standards, absence of material incentives to save resources, lack of maintenance by the utility companies and the high cost of water taps, fixtures and plumbing services. It was often mentioned that the low temperature of the hot water in the taps compels many people to run it off for long periods in the hope that it will get hotter and this also leads to major water losses.

To save electricity, the majority of survey participants ensure electric appliances are turned off as soon as possible and install low voltage bulbs in rarely used back rooms. Only a quarter of respondents (23%) said that their house has energy efficient (halogen or fluorescent) bulbs. Nobody knew anyone who used thermostats when using electricity for heating purposes. Respondents also said that practically nobody is concerned with saving light in staircases and few have heard about installing light switches with timers.

Analysis of the reasons for not using energy-saving bulbs (Diagram 7) suggests that more should be done to raise awareness of their advantages (53%) and reduce their cost (38%).

Figure 2.7. Reasons for not using energy-saving bulbs

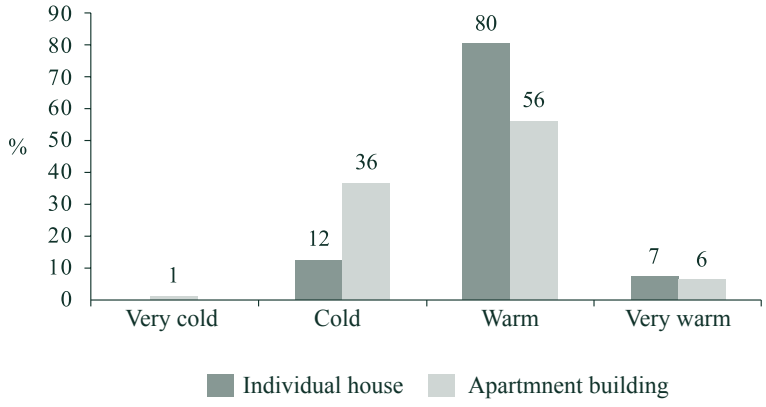


On the whole, introducing realistic tariffs for heating and electricity and developing laws that would stimulate energy companies to adopt energy conservation technologies would help expand the use of energy saving technologies and raise the awareness of the population about these technologies.

Respondents' satisfaction with heat, electricity and hot water supply [2]

The study revealed that the majority (80%) of individual home owners is warm during the winter time and only 12% of respondents said that their houses are cold due to their inability to buy more coal and pay for natural gas (Figure 2.8). More inhabitants of blocks of flats (37%) complain about the cold in their apartments.

Figure 2.8. How warm is your house/flat in winter?

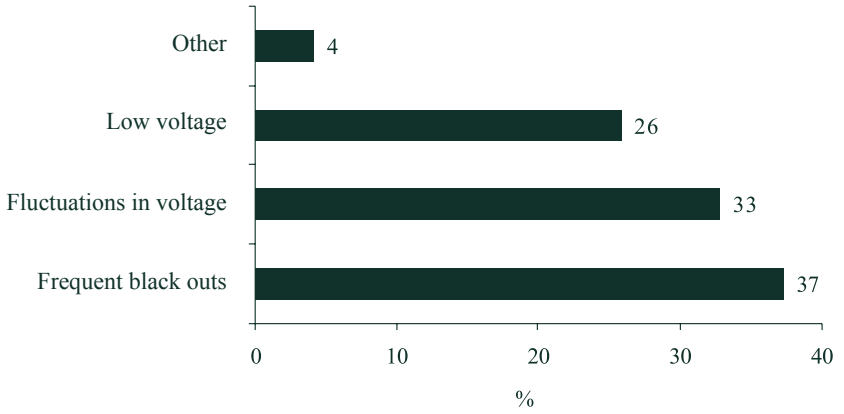


Inhabitants of blocks of flats are dissatisfied with the heating season, with heat being connected or disconnected without taking into account weather conditions. There have been cases when central heating radiators were not hot enough. Some mentioned that under the existing legislation energy companies are accountable only for the temperature of heat supplied up to the pump (heat distribution point within a house) and usually tenants are not aware of the temperature there.

About two thirds (71%) of respondents are not satisfied with their existing electricity supply, the main complaints being about frequent power cuts, voltage fluctuations and low voltage in the network (Figure 2.9.).

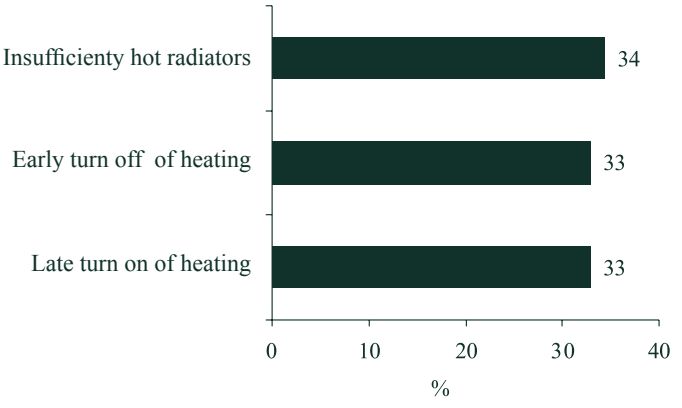
[2] While analyzing the satisfaction with heat and hot water supply the opinions of respondents using central heating and water supply systems were considered

Figure 2.9. Dissatisfaction with electricity supply



One third of respondents who use central heating think that the radiators are not hot enough. The rest are dissatisfied with the duration of the heating season (Figure 2.10.).

Figure 2.10. Dissatisfaction with central heating supply



During discussions on this question in focus groups people noted that "the climate in the country has changed in the past 10-15 years - winters have become longer, while the summers are shorter, however the municipal services refuse to recognize this and the heating season has remained unchanged in spite of changes in the climate." People think that it would be good to increase the flexibility of municipal services. If the weather is warm the heating temperature could be lowered even if it is December and on the other hand, if October is very cold the heating season should begin earlier." Greater flexibility in municipal services would save fuel and reduce electricity consumption and offer better services to the population.

Respondents' attitude to installing individual heating, water and other resource meters

Many respondents (25-30%) cannot decide on their attitude towards individual energy supply meters. Most approve of installing meters for natural gas (54%), hot water (47%), and heating (44%) while fewer respondents favoured installing cold water meters (39%).

Table 2.1. Respondents' attitude to installing individual heat and other meters (%)

Installation of meters for:	Support fully	Mostly support	Mostly against	Totally against	Don't know
Hot water	23	24	14	15	24
Cold water	18	21	18	20	23
Natural gas	31	23	7	12	27
Heating	23	21	15	17	24

During several focus groups almost equal numbers of participants took opposing points of view – some believed that installing meters would reduce payments, others - that it would raise costs. It appears, that both groups were using their experience with gas meters, after installing gas meters in their houses the first group started paying less, the second - more. Further investigation revealed that in the first group of respondents the number of people registered as living in the flat was the true number of people actually living there. In the second group the number of people actually living there (who also used natural gas) was greater than the number officially registered as living there and since before the meter was installed gas charges were based on the number of people registered there, for the first group installation was beneficial and for the second unfavourable. Based on this we can draw the conclusion that installing individual meters is supported more by "diligent" payers, while those who consume more than they pay for are against it.

According to the study the "diligent" payers are mostly respondents from small households, pensioners, and single people. The "non-diligent" consumer group included university students and families who lived in rented flats, including migrants from rural areas, large households and those who were insufficiently aware of this issue. We would like to mention that tensions were noted during focus group discussions between the two groups ("diligent" and "non-diligent" payers), the first group felt that they were in the unfair position of overpaying for those who use resources in violation of the existing rules. Thus, all participants were convinced that government bodies knew about this problem but have not taken any measures to resolve it. A solution to this problem was offered in the form of registering the populations of towns and cities and reforming the existing system of accounting for using resources and paying for utilities.

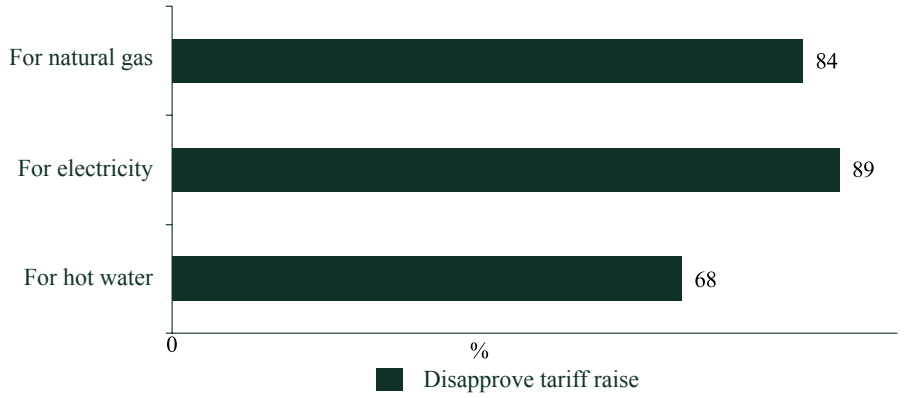
According to experts, the main obstacle to conserving resources at household level is a lack of information (lack of awareness of the advantages of installing meters), economic reasons (financial difficulties in purchasing meters and modernizing insulation) and technical reasons (specifics of technological processes, out-of-date equipment).

Summarizing the data we note the need to in raise awareness of modern ways and means of conserving resources among the general population. The existing system of paying for utilities should also be reformed along with the relevant legislation and departmental instructions. Moving from an equalized payment system to payment for actual consumption follows social justice principles and will serve as an incentive for conserving resources and clear information on existing consumption norms and payment calculations and on the actual benefits that this brings at the micro and macro levels would have an especially large effect on increasing the interest of citizens in installing meters in individual households.

Respondents' attitude to higher utility tariffs and alternative energy resources

According to the study the majority of respondents do not approve of higher tariffs for hot water, electricity, and natural gas (Diagram 2.11.).

Figure 2.11. Respondents' attitude to tariff rises



Forty five percent of respondents would like to switch to alternative energy sources and one third (33%) do not wish to switch. The number of respondents unaware of alternative energy resources is quite high - 21%. We note that in all group discussions, participants revealed very superficial knowledge of alternative energy sources and expressed a desire to receive more information about such equipment and devices (manufacturers, characteristics, suppliers, price ranges). Inhabitants of multi-storey blocks of flats cannot imagine using alternative energy resources in their blocks and believe this only applies to private home owners, or during the construction of new blocks of flats.

Participants in several group discussions mentioned the possibility of developing mini-boiler houses and mini hydroelectricity stations that would help reduce heat losses and provide small towns with heat. However, such suggestions were not supported by the majority. Basic arguments against mini-boilers and mini hydroelectricity stations were their high cost and environmental damage – "they would be located closer to houses and their chimneys would be short and accordingly cleaning will be worse."

3. HEAT AND ENERGY CONSERVATION IN BUSINESSES

The survey revealed a number of differences between heat and energy saving in state organizations and private enterprises, therefore it is suggested the two groups be considered separately.

Government and municipal entities

According to the survey, respondents working in government institutions are frequently cold at work. Discussions have shown that many state institutions prepare for the cold season by insulating windows with cotton strips and paper. This is done by the employees themselves ("we do not want to be cold"). If the rooms are really cold respondents say that they use "every possible heating device" that they bring from home or buy by sharing the cost among colleagues. Respondents agreed that using heaters at work raises energy costs for the institution, however, "who cares if we are not the ones paying for it."

The situation with water and power consumption is similar – none of the respondents were interested in how much energy or water is consumed by their institution/organization. Respondents said "if the administration doesn't care that the radiators are cold and water taps do not work, why should we care?" As public sector employees they "do not have any interest in saving resources at work", therefore "nobody cares about saving and economizing." Almost nobody thinks that increased tariffs for public offices would affect the efficiency of resource use, whilst about half of the focus group participants believe that "the situation could dramatically improve if the authorities implemented programmes stimulating resource conservation and offered real incentives to state institutions – cut taxes, provide benefits, establish (resource) savings funds etc."

Municipal entities will not save resources until new funding mechanisms are introduced. The Ministry of Finance allocates funding on paper, not in cash. If you did not use up your allocation, for example, you saved on heating or water, next year the allocation would be reduced by that amount and of course you would never see or be able to use that saving. It is therefore, so unattractive to save - what for? Why would the Ministry or any director modernize facilities and monitor expenses if in the end there are no advantages for the staff or the organization?

Expert, Bishkek

As to energy conservation funds, experts said that they exist only on paper. There is no accounting for how the money comes in, is taxed and used therefore experts suggested developing regulations on energy conservation funds that would provide realistic mechanisms.
According to experts the engineering infrastructure is dilapidated in all state institutions and little money is allocated for serious repairs or replacement of internal heating and water facilities and old window frames. Experts also say that state institutions rarely use energy efficient bulbs as no funds are allocated for these purposes.
According to experts, the state sector doesn't monitor or analyze utility costs and besides top management does not consider resource conservation a priority.
In conclusion, it is possible to say that the majority of survey participants consider the absence of stimulating legislation and the indifference of management and permanent staff as key barriers to energy and resource conservation in the public sector.

Private enterprises
As opposed to the public sector, private entities that pay for resources out of their own pockets ensure strict accounting and control. Participants have noted that resource conservation is a major topic of discussion at working meetings and their excessive use is limited. In private companies, it is top management that initiates preparations for winter – insulating windows and doors and using locally produced energy efficient heaters.

Top management of private companies is interested in increasing the energy and heat efficiency of their premises and therefore uses modern energy efficient technologies. No representative of a private company could remember a leaking water tap or lights on when not needed. The main motivation for such a careful attitude to energy and water resources for private enterprises is material incentives – "a business owner is not interested in paying more than necessary thus, leaking taps are repaired promptly and energy efficient devices are used."

In the experts' opinion, the private sector needs more information about new technologies that help save resources and this is a sufficient enough incentive for them.

The private sector swiftly reacts to everything, because it has to pay out of its own pocket. When meters are installed businessmen become instantly wiser – and start to count and save.

An expert, Bishkek

4. PROBLEMS OF HEAT AND ENERGY EFFICIENCY (EXPERTS' OPINION)

Deterioration of infrastructure

According to experts, the critically deteriorated heating network and infrastructure are among the core reasons for the low energy efficiency of utilities in the Kyrgyz Republic and they estimate that 50-70% of the heating network infrastructure, 75-80% of the electricity network - and 70-80% of transformers have deteriorated.

Nearly 75-80% of all heating pipes in the cities and towns of the country are laid in trenches and insulated with damp-proof fibreglass, which has poor heat insulating properties and in fact, has high moisture absorption properties that reduce the useful life of pipes and contributes to metal corrosion. It is one of the main reasons why heating pipes leak so frequently. Some experts talked about the importance of introducing modern insulation materials that would help reduce heat losses 2-3 fold and increase the useful life of pipes through preventing corrosion. Experts say that gas mains have also deteriorated and they are especially concerned with the condition of pylons, many of which are in a critical condition.

Take a look at the condition of gas pipes. Pipes from the Soviet times are not being painted, which leads to their premature deterioration, but the gas industry has no money to paint hundreds of kilometres of pipes and there is no law that requires users to paint the section of the pipe that goes through their territory.

An expert, Bishkek

Out-of-date construction norms and regulations

Another problem noted by experts was the poor heat retention of buildings, especially those that were built back in the Soviet times. Calculations made when designing buildings were standard and did not account for variations in climatic zones, and thus in summer the walls of these buildings are difficult to cool (during the day they accumulate heat and then emit it at night) and in winter they are hard to heat.

It used to be that construction norms didn't take into account climatic variations. For instance, houses of the 105 Series are used with the same thermal insulation in Osh and Naryn, which is unacceptable since the climatic conditions in these two zones differ drastically. We should be talking about developing construction norms that would eliminate such problems.

An expert, Bishkek

Technical problems

Another important problem highlighted by experts was the technical imperfection of existing energy supply systems. They emphasized that energy companies choose a strategy of plugging gaps - all efforts go into rebuilding old systems, rather than into introducing new systems and efficient technologies. The lack of technical specialists who could develop and offer innovative solutions was pointed out.

Installing individual meters

In some cases it was noted that the issue of reducing heat losses can be addressed only holistically through the introduction of modern energy saving technologies and effective energy management systems. At the same time an important first step is installing individual thermostats in houses with central heating, which would help account for and regulate heat and installing individual meters for hot and cold water and gas. International experience has proved that installing individual heating meters in combination with heat controls gives energy savings up to 25%. At the same time experts have emphasized that installing meters should not be the concern of the end users. Meters should be installed, repaired and maintained by the energy companies.

Yet to the experts, energy producers do not favour the introduction of individual meters and actually obstruct this process because existing standard norms for heat, hot water, and cold water consumption significantly exceed actual consumption and this difference is advantageous for the energy companies.

If we calculate how much hot and cold water consumption is paid for by city residents we can find out that our energy companies don't even produce that much. If we install heat and hot water meters for all consumers, our Thermal Electric Power Station (TEPS) would be unable to justify its claims about the cost of coal and gas. The TEPS is unreachable, it is physically uncontrolled and there is a well-based opinion that TEPS does not use as much coal as it reports. There is nobody to ask, TEPS just burns it and that's it. Nobody knows for sure how much hot water and heat is actually produced. It is important to install meters that will protect users and force energy producers to introduce new technologies.

An expert, Bishkek

Regulatory gaps and lack of legal incentives

Most experts say that the existing legislation does not offer incentives for reducing energy losses. This issue is especially acute in the state sector and at household level, both of which use centralised heating and water supplies. Almost all the experts emphasize the need for political will, revoking old laws and developing new mechanisms that would stimulate resource conservation. Another important component of the new system would be establishing energy audits that would reveal weak spots and offer ways of reducing energy losses for each individual object.

Outdated legislation not only doesn't stimulate consumers to save resources, but also hinders the introduction of energy efficient technologies. Many inhabitants of multi-storey blocks of flats realize that it is to their benefit to install heat and water meters, but there are no mechanisms to make it happen. The legislation lacks incentives for saving electricity, water, and heat and as a result the lights in offices burn uncontrollably, water taps and toilets drip, windows are not insulated and doors are wide open. Without new legislative incentives we will not be able to tackle the problem. We desperately need new laws and new construction norms and only then will they start thinking about energy conservation and address energy efficiency issues.

An expert, Bishkek

SUMMARY

The results of the survey helped draw the following conclusions:

- Outdated legislation restricts new ideas and incentives for energy companies and does not stimulate them to offer better services.
- Obsolete construction norms that do not take into consideration climatic differences lead to inefficient use of energy and reduced comfort.
- The existing system of offsets with state budget-funded institutions encourages inefficient use of resources and lacks any incentives for energy conservation and introducing energy efficient solutions.
- Existing categories of free energy users do not stimulate the conservation of resources.
- Meters should be installed at all energy sources to ensure fair economic calculation of consumption levels. Users should not be involved in supplying meters, which should be the property of energy companies that should be responsible for their installation, maintenance, replacement, control etc.
- Introducing realistic energy tariffs would stimulate energy conservation and energy efficiency since it would allow companies to get returns on installing modern equipment.
- A promotional information campaign and the installation of energy-saving and energy efficient equipment should be part of the work of energy companies as part of environmental programmes.
- It is important to make energy companies aware of and encourage them to introduce new technologies and new technical solutions.
- There is a need for economically sustainable and socially acceptable solutions to social issues in the energy sector. First of all this implies eliminating cross-sector subsidies and streamlining pricing policy.

PRESERVING THE FISH STOCKS OF THE ISSYK-KUL LAKE BASIN

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INTRODUCTION

Free market processes in society and liberalisation of the economy and a decline in the level of fishing industry management and ever more serious difficulties in the area of fish breeding, which is by its nature an expensive and unprofitable business, has resulted in a general decline in the area of breeding fish stocks and a drop in the number of species of fish.

The continual reduction of the biological diversity of species of fish in Issyk-Kul Lake is forcing the existing strategy of preserving species to be reconsidered. Due to systemic economic problems in our country it is becoming impossible to preserve water-based ecological systems without drawing up a special set of state programmes aimed at solving a whole series of linked problems.

According to scientific data the current measures are not effective in spite of efforts undertaken to preserve the biological diversity of fish. Endemic species of fish, which are the natural wealth of Issyk-Kul Lake, are in the most critical state.

If urgent action is not taken, soon such irreplaceable species as marinka and naked osman will be lost forever and chebachok and chebak are under threat as well.

The current catastrophic situation with endemic species of fish requires urgent joint actions to be taken but these cannot be properly developed without considering the opinions and preferences of those engaged in the fishing industry, so a survey of the situation in communities and households of Issyk-Kul province has been included.

1. METHODOLOGY AND PURPOSE OF THE SURVEY

The main purpose of the survey is to provide the Customer with information on the socio-economic status of the families engaged in the fishing industry[1] (fishing, processing and selling fish), their dependence on them and the reaction to be expected to the introduction of the new fishing regulations and seeking alternative sources of income for this group of households.

Taking into account the above circumstances within the frameworks of the project, several target groups were chosen:

- Experts;
- The population;
- Licensed and unlicensed fishermen;
- People engaged in processing fish;
- Fish Sellers;
- Fish Distributors.

The survey was designed to get the suggestions of respondents using a combination of qualitative and quantitative methods for which appropriate tools have been worked out:

- General Questionnaire;
- Guide to semi structured in-depth interviews with experts;
- Guide for FGD with those engaged in the fishing industry.

Information about survey respondents is given below.

[1] Here and further in the text fishing, processing and selling fish is called the fishing industry

Table 1.1. List of expert structures

1	Fish Industry Department of the Kyrgyz Republic
2	Public Fish Inspectorate under the State Forestry Agency
3	State Administration of Issyk-Kul Province
4	Local self-governance of Issyk-Kul Rayon
5	Issyk-Kul Oblast Department for the Preservation of Biodiversity Resources and Bio-resources Management
6	General Directorate of the Biosphere Area
7	Issyk-Kul Bio Station of the National Academy of Science of the Kyrgyz Republic
8	Aleine Ecological movement
9	Provincial Environmental Protection Committee
10	Education System
11	Local Governance Bodies
12	EDITA NGO
13	Young People's Ecological Television
14	Syrdash NGO
15	Balykchilar Ltd.
16	Fish Processing Unit Cholpon-Ata
17	Mayak Sports Tourism and Fishing Centre
18	FINKA Corporation
19	Market Administrations

Table 1.2. Data on the number of completed questionnaires

	Survey areas	Number of interviews
1	Kara-Oi Village (Dolinka), Issyk-Kul rayon	30
2	Kuturgu Village, Tiupsky rayon	25
3	Kurmenty Village, Tiupsky rayon	5
4	Cholpon-Ata Town, Ussyk-Kul rayon	25
5	Balykchy Town, Issyk-Kul rayon	15
6	Kara-Talaa Village, Tonsky rayon	30
7	Kara-Shaar Village, Tonsky rayon	29
8	Kyzyl-Tuu Village, Tonsky rayon	31
	Total:	**190**

Table 1.3. Data on Focus Group Discussions

	Rayon, village
1	Kara-Oi Village of (Dolinka) – people engaged in processing and distributing fish
2	Kuturgu Village, Tiupsky rayon – fishermen
3	Oriuktu Village – fishermen
4	Balykchy Town – people engaged in processing and distributing fish

Overall, the opinions of 251 people have been collected and analyzed.

2. FIELD STAGE

Two days training was held before field work began for all the interviewers and moderators. Analysis of the survey methods and working with the tools was covered on the first day and practical interviews were conducted on the second day. Then the interviewers and moderators were assigned their survey areas.

The field stage was slightly complicated because of difficulties finding respondents, especially unlicensed fishermen, who are afraid of being prosecuted and some of them would not give recorded interviews and this presented data processing difficulties.

3. CHARACTERISTICS OF RESPONDENTS ENGAGED IN THE FISHING INDUSTRY

The survey showed that the social breakdown of people currently engaged in the fishing industry is varied and heterogeneous and different groups have different interests, motivation and vision of the problems.

On the whole, three main groups exist: fishermen and people engaged in processing and distributing fish.

Fishermen

Information received in the course of the survey enabled all fishermen to be divided into two large well-defined groups that we will refer to as hereditary and new fishermen. Hereditary fishermen are those, who have been engaged in fisheries for a long time: 8 - 9 and more years and whose fathers and grandfathers also worked in the fishing industry and in the recent past were professional fishermen. All of them were registered at one or other of the existing fish factories and in due course were trained there in the fundamentals of the fishing industry, fish breeding, fishing standards, fishery protection provisions, etc. They were full time employees of the fish factories and had all the social guarantees and if they met the fishing standards they were paid salaries by the factories. The researchers noted that nearly all of them were Russians. On the whole, the main distinctions of this group were their professionalism, personal qualities to fish - «to walk on the water»[2], i.e. to fish not only for money but also for one's private satisfaction, love of fishing and a desire to preserve the fish and lake for their children and grandchildren; this group is deeply concerned about the existing problems in the fish sector of the province and was the most emotional group in the course of discussions on the issues of violating the fish protection legislation.

New fishermen are another large group who began fishing quite recently, often within the last 5 years and neither their fathers nor grandfathers worked in the fishing industry. Till recently agriculture was the main occupation of this group: growing crops, livestock breeding and working on collective and state farms. According to the researchers, significant numbers of this group are Kyrgyz whose main motivation is money. This group doesn't know very much about breeding techniques and is less concerned about fish stock preservation issues than the first group. This group was emotional and interested in the course of discussing the issues related to different aspects of their life and opportunities to receive assistance.

In-depth research proved that a significant number of the fishermen from both groups have no official permission to fish and from a legal point of view they are poachers.

None of the interviewed fishermen are involved in processing and delivering fresh fish to the processors or dealers.

[2] Here and further on participants' opinions are virtually unedited in the text

People engaged in processing and selling fish

Discussions and meetings with people engaged in processing/selling fish led us to believe that this type of activity is totally new for the population since independence and conversion to a market economy. Practically all those engaged in processing said that their parents had never engaged in fish processing commercially and usually in the past they processed fish for their own consumption and only an insignificant part was sold and that just in the tourist season. The majority of people engaged in processing have organized small domestic family businesses, so that they can control the volume of production, increasing/reducing it as required. Accordingly, the number of distributors selling fish on the beach is changing. People engaged in processing and selling who took part in the survey said that many of them purchase a patent (fixed monthly rate tax deduction certificate) for the right to trade.

In the course of the discussions, representatives of all three groups said that the fishing industry is not their only source of income however, for the majority of them it is the only source of day to day living money. It was mentioned that early spring ploughing and cattle-breeding require significant capital investments in seeds, fuel and lubricants , forage, etc. and these expenses could not be recouped until harvest time so income from fish give families day to day money to do other things.

Relationships with controlling structures

Respondents mentioned controlling bodies one way or another so it is quite interesting to analyse the relationship between the surveyed groups and these structures.

According to experts' data, currently there are seven controlling structures in the province, which are subordinated to different agencies: The Ministry of Emergency Situations, State Forestry Agency, Ministry of Agriculture, Water and Processing Industry, Public Forest Reserve and Special Office of the Public Prosecutor and the following control observance of fish protection legislation: National Security Service, Police, Office of the Public Prosecutor and representatives of local governance bodies at all levels from Aiyl Okmotus (local councils) to Governors. Discussion participants mentioned cases, when some unauthorised joint activity structures, which have no proper professional experience, have started controlling fishing activities.

Analysis of respondents' answers shows that not only ordinary residents of the province, but also some experts understand the functions, authorities and obligations of controlling bodies. During the survey researchers came to the conclusion that in some cases areas of control intersect with all these bodies, i.e. the activities of one subject, for instance a fisherman, is under the control of too many supervisors. However, this issue requires additional functional analysis of the provisions of all controlling bodies with the aim of discovering duplication and help in optimising the distribution of functions.

Some experts think that too many organisational-structural reforms, which take place each time the Government and Province Administration change, are carried out within the system. Often, these reforms are inadequate and do not consider the specificity of the problems and conflict with the activities of existing structures, causing chaos and confusion. As an example experts mentioned the ecological police set up in a hurry and thoughtlessly and which disintegrated after six months.

Meetings conducted with representatives of controlling bodies showed that there are significant problems within their structures and implementation of activities. A poor equipment and technical base, lack of communications facilities and shortage of vehicles and water transport are the main ones, as in the case of the Province Department on Biodiversity Conservation. The whole staff consists of 24 employees, of whom 18 are permanent and five are freelance inspectors. The post of ichthyologists was abolished in the course of structural reforms. The monthly wages of employees are 800-1000 KGS, less than the income of fishermen and people engaged in fish processing. Moreover, there are an additional two or three freelance inspectors in each rayon. A simple arithmetic calculation shows that about 50 inspectors work for the Department.

In the course of in-depth interviews with inspectors it was clarified that they do not even have elementary working conditions: expenses for transporting away confiscated fishing gear and for petrol and fuel for motorboats are not paid, no new boats have been purchased for a long time, there are not enough uniforms and there are no portable radio transmitters or modern communications facilities. Under such conditions inspectors are unable to fulfill their functions without breaking the law.

Just look: my wage is 900 KGS. In order to catch the poachers I have to drive or go by boat to inspect all the lake. What does the state think? Should I pay for the fuel out of my wages? If so, what should I take home? Or, for instance, for efficiency I need communications and I purchased a mobile phone. People would call me from everywhere and tell me about lawbreakers. Who'd pay for the calls? Again, should I cover these expenses from my wages as well? So, I work like this: three poachers are caught – I draw up a charge sheet against one of them; another one is forced to purchase fuel for me and the third one would pay for my cell phone. Everyone is satisfied.

Interview with an inspector

Speaking of the wages of freelance inspectors we should add that in accordance with the Administrative Code all cases are sent to court and the freelance inspector can only get his/her 30% commission after a sentence has been passed. As the courts are overburdened, it could take 4, 5 or more months till the inspector receives his/her payment. According to experts this reduces the motivation and interest of freelance inspectors in officially registering cases: for them it is easier to accept a fine in cash or payment in kind on site and not register the case at all.

In the course of private conversations inspectors mentioned that in spite of the low wages it is too complicated to find a job in this area: "It is the same in the Public Motor Licensing and Inspection Department. Those, who don't pay, are out of a job" and it was explained that there are "backhanders to those at the top" and "one's own team".

Analysis of the received data leads to the conclusion, that relations between representatives of the fishing industry and controlling structures have become a serious source of corruption. It is terrible that almost all the survey participants "found ways to co-exist with inspectors" and they seem to be quite happy with it, nevertheless, we should note that there are some experts and ordinary people who do not want to put up with the existing situation.

Discussion participants said that observance of the law is not the main task of the controlling bodies who think of obtaining quick promotion and improving their standard of living at the expense of fishermen. It should be stressed that all categories of respondents think that the controlling bodies perform their duties badly but most of all with fishermen. Experts and indirectly, people engaged in processing and sellers themselves explain that this the result of the existing legislation, as a seller cannot be guilty of selling illegal fish, only fishermen can be guilty, so people engaged in processing suffer less harassment from inspectors/supervisors and accordingly, they are more loyal to them.

Nevertheless, in the course of FGD it was reported that lately controlling bodies have been taking finished products from people engaged in processing and distributors on trust (so to speak), promising to pay later, but forget to pay.

Based on respondents' answers a pyramid of corruption for each controlling body can be drawn. Ordinary officials (inspectors, ecologists, policemen, employees of the Office of the Public Prosecutor, etc.) are on the ground floor. They are in touch with fishermen and people engaged in processing and selling fish daily and this allows them to accept small sums, which are often taken as payment in kind, because the disposable income of this layer of the population is quite small and only substantial when aggregated from a large number of people. It should be noted, that ordinary officials themselves are the links to the fishing industry per se: for example, fish taken from fishermen is sold by inspectors to people engaged in processing; products taken from people engaged in processing can be sold or go under the knife of

inspectors or other supervisors, who control the ordinary officials. Often, boats and engines taken from one fisherman are sold to another one at a reasonable price.

Larger entities and large sums of money appear at the top levels as a result of organised inspection teams. Participants of FGD mentioned that inspection teams work without official permission, break the fishing legislation persistently and fish in the spawning period in spawning beds and are officially protected by higher officials (under so-called 'roofs') because all the fish is delivered from the province to the capital openly.

Moreover, in the course of discussions it was clarified that visits by any national level officials from any establishment to the province involves lavish fish dishes, the fish for which are 'legally poached' on the orders of high and mid level officials in violation of the legislation.

Participants in group discussions talked of internal corruption inside controlling bodies, - the so-called "backhanders to the top". A percentage of the bribes received from low level officials is passed on to the higher level and these are the so-called regular payments. Thanks to "backhanders to the top" each inspector "justifies" his post and hopes for further career development. The income he would receive in a senior post would cover his costs and this is known to everyone. Thus, this pyramid works like a multi-feed pump sucking up funds received from low level officials and entities higher and higher up the pyramid.

It should be noted that sometimes mid and low level officials, in spite of some advantages of their position, nevertheless, become the victims of existing procedures and have to bribe "be attentive"[3] and give "backhanders to the top".

According to fishermen this 'business' causes tremendous damage to preserving fish stocks, including endemic ones and promotes corruption and the illegal enrichment of some people.

Another indirect, but no less dangerous result of illegal and corrupt business is the devaluation and distortion of such social regulators of human behaviour as standards of rights and morals, religion and public opinion.

Research into the influence of corruption on the consciousness reveals the irreversible degradation of officials. Officials themselves said that "in the beginning it is difficult to accept bribes and gifts. When it becomes a habit and you get no bribes then you feel bad and do everything possible to get a bribe[4].

The majority of experts' opinions concerning controlling bodies tally with those of fishermen and people engaged in processing and selling fish in many aspects. However, in contrast to ordinary people, experts find the reasons for the existing situation not only in inspectors' personal characteristics but also in the existing state system. Experts consider the lack of interest shown by the administration in solving the problem, low wages, poor equipment levels and legal issues the main reasons for corruption.

Experts mentioned that having the opportunity to regulate the term of beginning and finishing the fishing season in the spawning season, controlling bodies often develop procedures in order to make it possible to collect extra money and bribes and organise their own shadow business. In this case, according to respondents, the burden of payment actually becomes a second official tax from legal entities and natural persons.

[3] Corruption in Central Asia and the Ural- Siberian Region of Russia/Public Opinion Research and Forecasting Centre, Bishkek, 2002, page 29.
[4] Ibid, page 36.

Proposals to improve the work of controlling bodies

On the whole, it can be said, that the sad truth is that the bodies overseeing observation of the fish stocks protection legislation, are a link in the general chain of corruption and any anti corruption measures would go against the existing personal and group interests of officials working in this system and it is possible to assume that corruption in controlling bodies is not only expanding but becoming institutionalized and legalized.

Due to the above-mentioned reasons and according to the opinions of survey respondents it is necessary to completely change the way controlling bodies work and are managed. Suggested measures included:

- Carry out a functional analysis of the bodies controlling fish stocks to manage their activity;
- Find funds to improve the equipment and resources of the Department for Bio Resources;
- Provide inspectors with secure communications facilities and uniforms;
- Consider increasing the wages of Department employees;
- Strict observance of the fish protection legislation should be the main aim of inspections;
- Simplify the punishment system under Article 149 of the Administrative Code by making it possible to impose fines not only in court, but also in the Department for Bio Resources in accordance with the procedures specified in the law;
- Include the position of fish expert in the list of members of staff of the Department on Bio Resources;
- Improve the knowledge of employees of the Department on fish protection legislation;
- Consider working with donor and international organisations on a proposal to issue a set of new laws and regulations for inspectors that would significantly improve their activities;
- Amend the legislation on the fishing industry to extend the closed season when fishing is banned;
- Purge the inspectorate of corrupt officials, especially those who organise and work in inspection teams;
- Set up a help line in the Department that people can call from any part of the province;
- Raise people's interest in rooting out corrupt employees by providing incentives to do so;
- Train the population, fishermen and people engaged in processing to resist corruption.

On the whole, experts are convinced and believe that revamping controlling bodies would lead to a recovery in the fishing industry in the republic.

4. THE PLACE OF THE FISHING INDUSTRY IN THE INCOME STRUCTURE OF THE POPULATION IN THE PROVINCE

Experts' assessment

According to the majority of experts, about 1,000-1,500 households in the province are engaged in the fishing industry, of which 500 are engaged in fishing and about 1,000 in processing (salting and smoking) and selling fish. Considering the average number of people per household in the province[5] it can be said that about 6 – 7 thousand of people are involved in and profit from the fishing industry, while other experts reckon about 3-5% of able-bodied citizens of the province do so[6] - from 6 - 11 thousand people.

According to overall experts' opinion, the fishing industry account for 30-35% of overall income in many cases. Almost all experts mentioned a number of villages, where, according to them, income from the fishing industry accounts for 60-70% and some individual cases 100% of families' budgets.

People's assessment

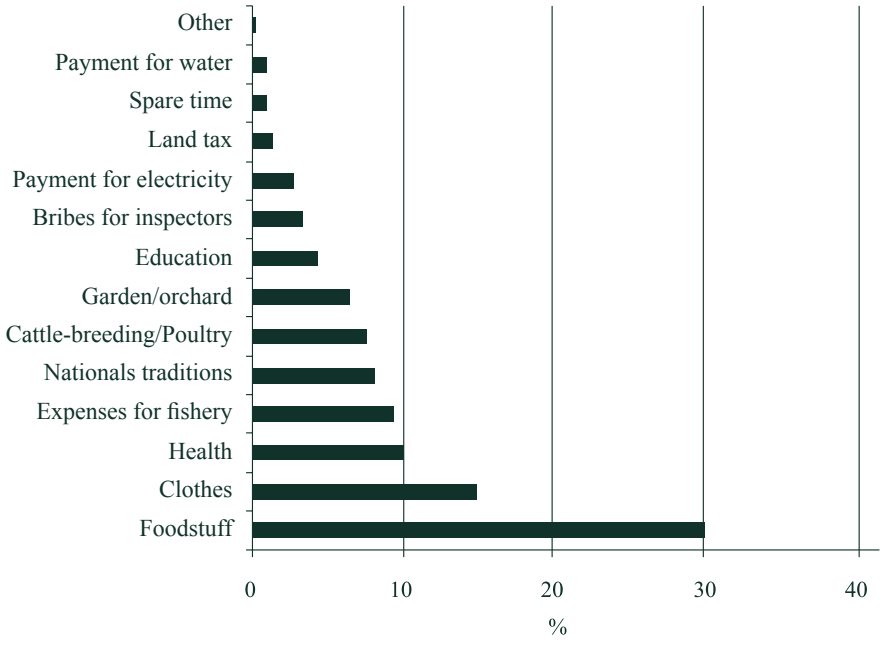
81 respondents (43%) out of 190 told the researchers that they are engaged in the fishing industry. In all these households only one member of the family was engaged in the fishing industry during field work on the farms. However in the course of collecting further information it was discovered that in the fishing season practically all members of households are engaged in the fishing industry directly or indirectly. There were examples, where the wife is engaged in salting fish, the husband – in smoking them and small children – in selling fish in the market and leisure centres, whilst older children work in the fields and look after the livestock.

During the tourist season members of fishermen's families join in the fishing industry by helping deliver the fish to those engaged in processing fish.

Breakdown of expenses in households of focus villages

Analysis of the breakdown of expenses in households of focus villages showed that expenses mainly consist of 13 items (Figure 2.1.). The biggest expense items are purchasing food and clothes, which account for 45% of the total. The next biggest expense is on health (10%).

Figure 4.1. Breakdown of expenses of surveyed households



Expenses related to the fishing industry account for slightly more than 9% of expenses on average, the fourth highest expenditure item.

Further data analysis shows that the population of the surveyed villages pays special attention to the observance of national traditions and holidays on which 8% of expenses are spent, more than on livestock-breeding/poultry and orchards/gardens. It should be noted that expenses for education account for about 4% and slightly exceed expenses given as bribes to controlling bodies (3.3%).

Analysis of the breakdown of expenses related to the fishing industry in village profiles showed distinct trends of villages specializing in the fishing industry (Figures 2.2.- 2.4.).

For instance, in some villages residents generally engaged and fishing and transporting fish (Kyzyl-Tuu, Kara-Shaar and Karatalaa) and in others employment in processing and selling is evident (Rybashje, Dolinka and Cholpon-Ata).

Expenses related to transport account for an insignificant percentage of expenditure. There is no significant difference and in many cases they comprise no more than 2.7%, proving there is no major specialisation in transporting fish.

Figure 4.2. Expenses on the fishing industry

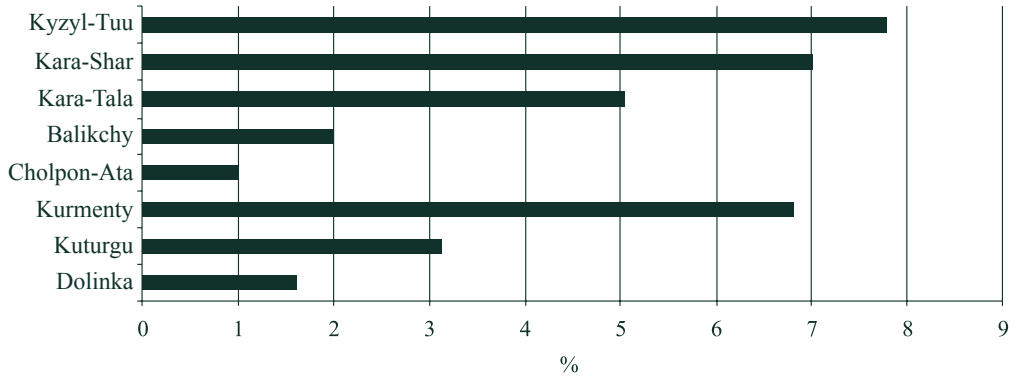


Figure 4.3. Expenses related to fish processing and selling

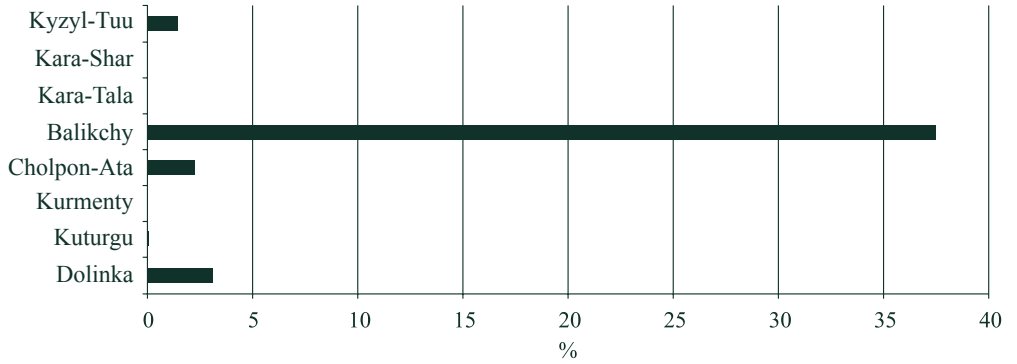
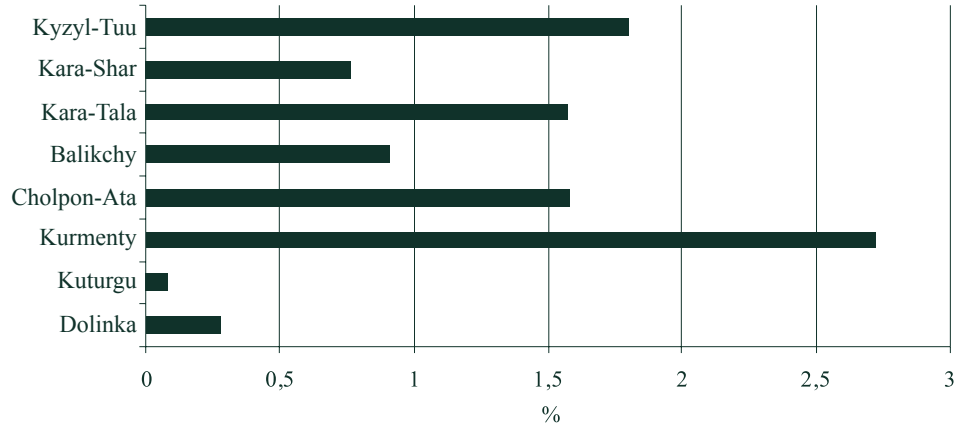


Figure 4.4. Expenses related to transporting fish



Expenses for fishermen cover purchasing fishing gear (boats, nets, etc.) and diesel for motorboats, etc. At the same time the expenses of people engaged in processing include purchasing fish, salt and sawdust.

In the course of discussions it was clarified that fishermen's expenses are higher than those of people engaged in processing.

These data show that, on the whole, the fishing industry is quite important for all the survey locations, while a significant part of the family budget is spent on organising the fishing industry, in some cases from 9 to 40%.

Income in households of surveyed locations

Analysis of generalised data on the monthly family income of respondents by geographic location of villages reveals the following trend: the nearer the village is to recreation centres, - the higher the income of respondents, thus, the highest average monthly income is received by residents of holiday resorts: Cholpon-Ata, Dolinka, Kurmenty (from 2,800 to 3,600 KGS) and the lowest is received by residents of Kara-Talaa and Kara-Shaar (980 - 1,300 KGS).

Figure 4.5. Data on average income in survey locations

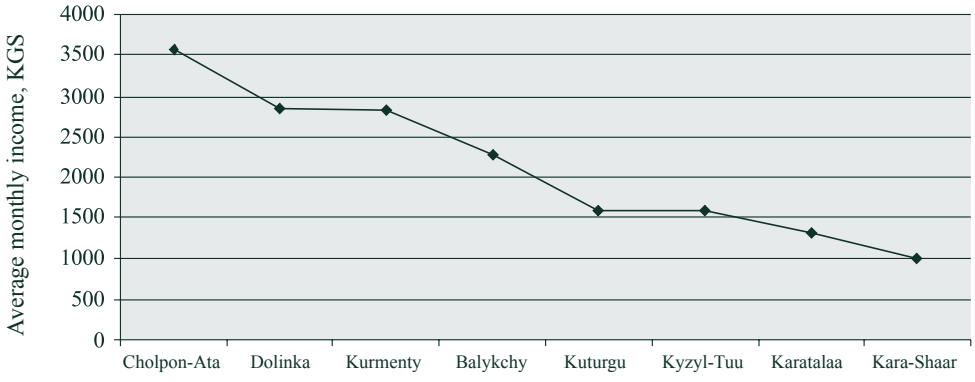
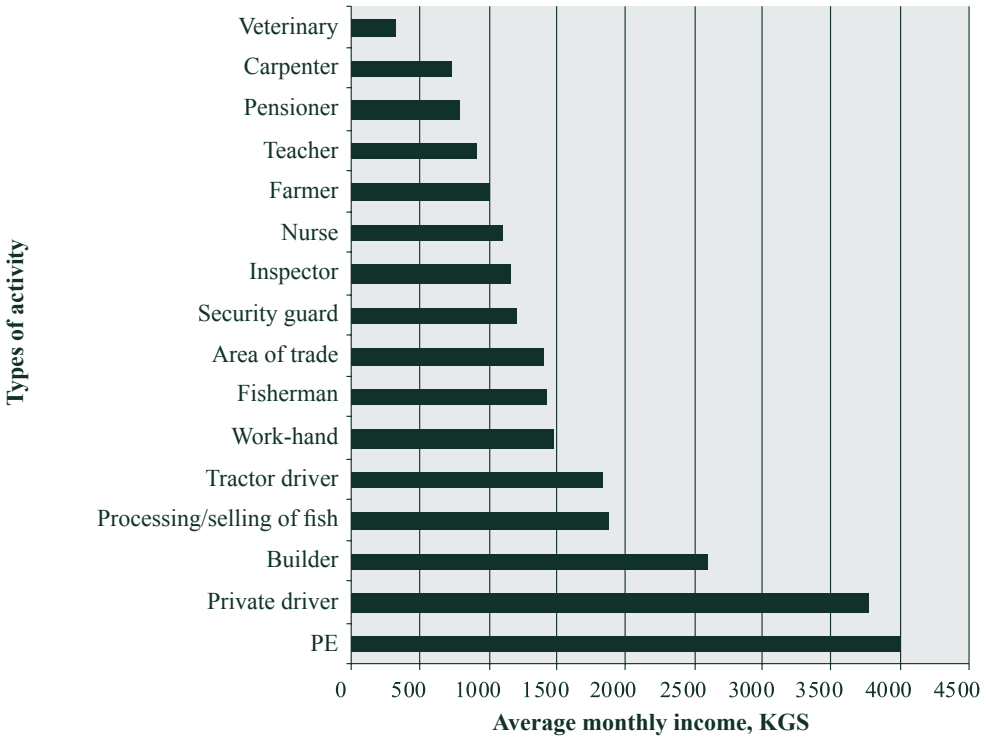


Figure 4.6. Respondents' income by type of activity

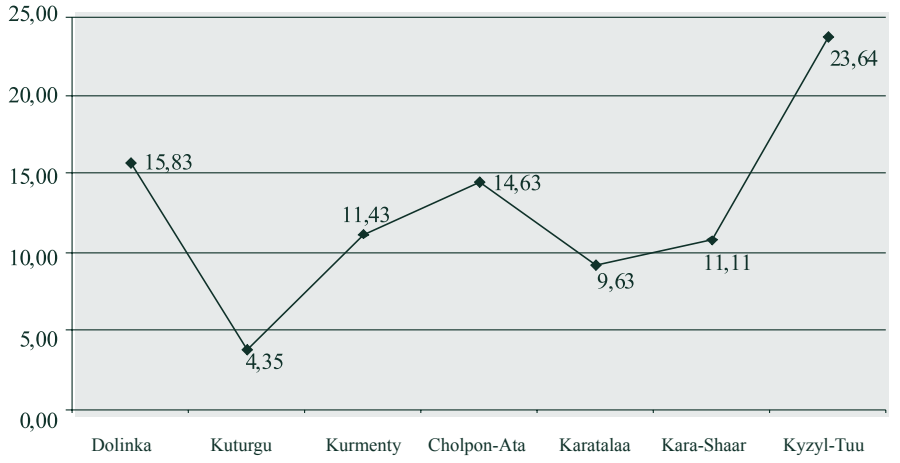


Analysis of average monthly income by employment sectors reveals the most profitable areas of respondents' activity. These are private entrepreneurs (4,000 KGS), private drivers (3,700 KGS) and construction professions (2,600 KGS) (1 USD = 36 KGS).

The fishing industry also brings in good money, however, people engaged in processing and sellers of fish earn more money (1,900 KGS) than fishermen (1,400 KGS). Nevertheless, incomes of respondents engaged in the fishing industry are higher than the incomes of farmers, nurses, teachers, pensioners and some other categories (Figure 2.6.).

Analysis of households' income structure shows that, on average, income from fish business is 13.56% of aggregate household income. Data given in Figure 2.7. show that this indicator varies according to survey location from 5% in Kuturgu to 24% in Kyzyl-Tuu.

Figure 4.7. Income percentage from the fishing industry in the aggregate income of surveyed households

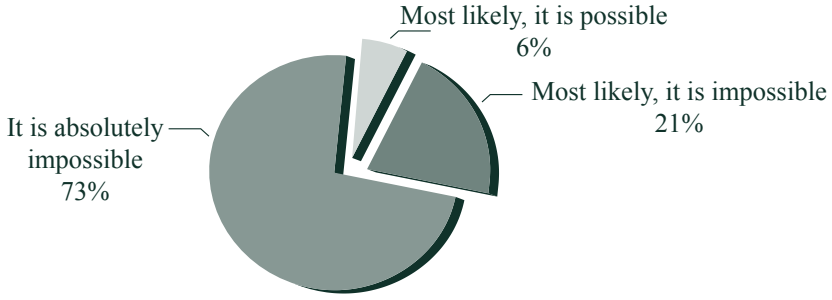


Another important detail is the relatively small risk of being engaged in the fishing industry. Participants of FGD mentioned that the risk related to loss of harvests, for example, is significantly higher. In agriculture it is not known whether the invested expenses would be recouped or not and the expenses are higher.

By assuming the average monthly income from fishing and taking into consideration the approximate number of those engaged in it, according to our research the fishing industry is worth up to 2.6 million KGS per year.

On the whole, the vast majority of survey respondents (94%) mentioned that the income earned doesn't allow them to save money to purchase durable goods or pay to educate their children in higher education institutions (Figure 2.8.) and only a very few think that this income allows them to save money to some extent - this was mentioned by entrepreneurs, taxi-drivers, several farmers, one fisherman and a person engaged in processing fish.

Figure 4.8. Respondents' opportunities to save



5. THE FISHING INDUSTRY AND ENDEMIC ICHTHYOFAUNA

In the course of discussions with fishermen it was clarified that generally, they fish for food fish, like trout, pike-perch, chebak and chebachok, whilst interviews with people engaged in processing and selling fish showed that chebak and chebachok are the most popular with tourists. Big fish are more expensive and accordingly, take longer to sell. So, in the fishing season people engaged in processing try to purchase endemic species (chebak and chebachok) and even order deliveries of them from suppliers.

In the course of FGD fishermen mentioned that periodically some rare endemic species of fish, like marinka and carp, are caught in their nets. With regards to osman, the majority of fishermen couldn't remember, when this species of fish was last caught in a net. Fishermen mentioned that if rare endemics are small and uninjured, they release them back into the lake. However, in-depth research into this issue revealed that when big fish were caught (marinka, osman) the majority of fishermen would keep them in spite of the fact that they were carrying roe and uninjured. This was confirmed by inspecting the main markets, where the fish are sold, where in the course of their field work researchers found average sized marinka openly lying on a counter. The seller, knowing he/she would not be punished was not embarrassed that a fish that it is illegal to catch, was on display and said: "It was brought to me and I bought it. If I do not buy it, then someone else would and if no one buys it, it would be thrown out and rot. Now somebody can benefit from it."

Attitude to a moratorium

Experts' opinion

Experts were of one mind in that they were against a total moratorium on fishing in the Issyk-Kul Lake basin and think that a ban on fishing is required, but it should be done in strict agreement with the law on the fishing industry for a definite period, at some particular sites and for certain species of fish. Some experts suggested a moratorium on chebachok for 5 years, limiting fishing for chebak in the spawning

season and introducing a total moratorium on fishing for osman and marinka for 15-20 years.

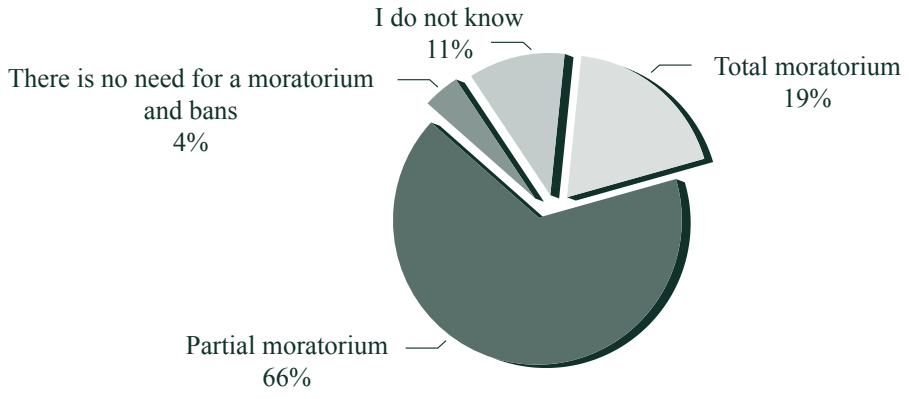
In general, other experts agreed with the need for a moratorium, but they couldn't answer the questions in details, saying that serious scientific grounds would be needed for it and the decision should be based on scientific evidence and not administrative decisions.

When discussing the practicality of a moratorium experts gave examples of bans on fishing for trout that led to increased numbers and scientists and representatives of controlling bodies are more positive than other experts about introducing a moratorium.

The population's opinion

66% of the people interviewed support the introduction of a partial moratorium on fishing and 20% think that a total moratorium should be introduced, while 10% found it difficult to answer this question and 4% are against any moratorium and limits on fishing (Figure 3.1.). The population supports a moratorium on fishing for trout, white-fish, osman, chebak and marinka.

Figure 5.1. Opinion of the population on introducing a moratorium on fishing



However, data analysis shows that opinion on the issue of introducing a moratorium and attitudes to it, are unequal in different layers of the population. Representatives of the fishing industry are most critical of the introduction of a total moratorium, especially those whose main income depends on the fishing industry. Amongst those physically involved in the fishing industry the most negative attitude is held by processors, sellers and new fishermen, whilst hereditary fishermen have the most reservations.

In-depth research into this issue in the course of FGD confirmed the existing differences in assessing the need for a moratorium.

Imposing a moratorium

On the whole the population is quite pessimistic (38%) about improving the situation on conserving endemic fish after the introduction of a moratorium and nobody believes it would be enforced.

It should be noted that not only the population, but also experts, including representatives of controlling bodies have doubts about enforcing a moratorium. Controlling bodies are not sure that they would be able to enforce a moratorium because of their poor equipment, lack of communications facilities and vehicles. Some experts consider enforcing a moratorium impossible not only due to the weakness of the controlling bodies, but also due to their corruptibility and low level of economic development in the province and lack of other areas of employment for the population.

Research showed that hereditary fishermen are the most pessimistic group about enforcing a moratorium and think that the current "bans exist only for some fishermen and inspection teams have the green light to work all the time"; "A moratorium would not be observed. This is just broadening the sinecure

of inspectors"; "Even if we stop eating fish, officials would eat fish anyway and the fish would also be delivered to their home."

Possible reaction of the population to a moratorium
83% of respondents think that the majority of residents of their villages would be against a total moratorium and 69% a partial moratorium and about 7-8% think that both a total and partial moratorium would not be supported in their villages.

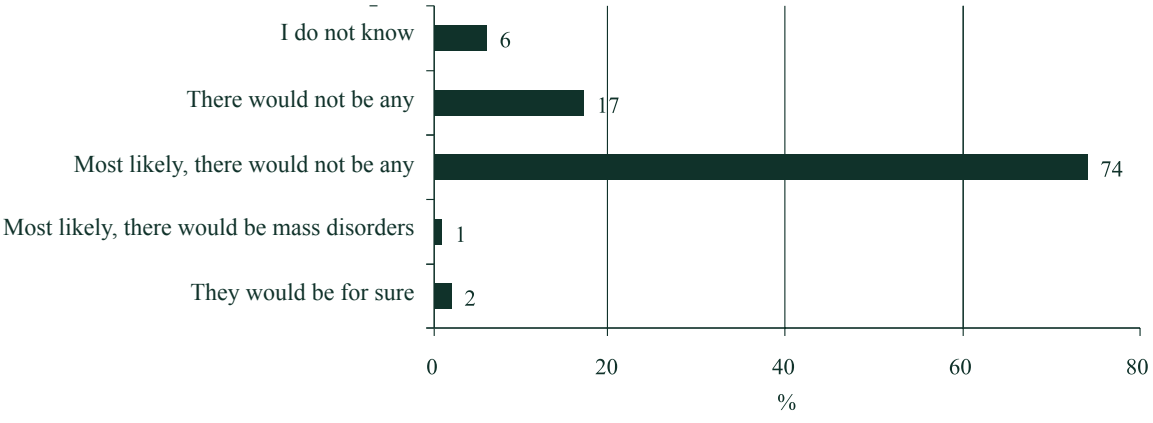
In general respondents' answers make it possible to forecast several possible reactions to the introduction of a moratorium:

- People, who are not engaged in the fishing industry, would be indifferent to a moratorium and would not react to it.
- The majority of those engaged in the fishing industry would be against a total moratorium and support a partial one and of them:
- About half support a moratorium, but would not know what to do if it was imposed;
- About 1/3 of fishermen and the people engaged in processing would ignore a moratorium (full or partial) and say: "It doesn't matter. In spite of any moratorium we'll fish as we fished before. You are unable to cover all the lake with inspectors. Even if it is possible, inspectors want to eat as well and have to feed their families"; "If fish is delivered we'll buy and sell it. We have other sources of food".

Approximately 20% of representatives of the fishing industry said they would observe a moratorium and plan to find other work.

The majority of respondents (74%) think that there would be no widespread dissatisfaction if a total or partial moratorium was imposed and about a quarter think there could be widespread protests (Diagram 10).

Figure 5.2. Opinion of the population regarding the possibility of mass protests if a partial moratorium were to be imposed



6. SEARCH FOR ALTERNATIVE SOURCES OF INCOME

Experts' opinion
Considering the difficulties for the population in adapting to new activities the majority of experts think that the population would need assistance. First, it was suggested that low-percentage long-term (not less than one year) credit lines be opened for agriculture as subsidies and credit lines for livestock-breeding development are the most promising and other alternatives are gardening and hothouse market-gardening.

Representatives of public administrations think special attention should be given to the development of factories to process mushrooms, berries and sea-buckthorn oil and juices in modern in tetra packs, as there is a big demand for them, especially in the tourist season.

It was mentioned that last year people engaged in processing have mastered the processing of sea fish and consider this to be a promising direction.

For areas where the necessary conditions are available, it was suggested that a pond fishing industry be developed.

Some experts suggested developing ecological tourism, sport fishing and other types of private activity in the most vulnerable villages after the introduction of a moratorium.

Population's opinion

It should be noted that experts and the population's opinions on searching for alternative sources of income are closely linked.

The majority of the population thinks that in the event of a moratorium they should turn to livestock-breeding and agriculture. Some people plan to work as taxi-drivers and carpenters and learn a construction trade and some plan to open processing workshops. On the whole respondents think they would need financial and technical assistance and training in their new professions.

Respondents, who would like to develop agriculture in the event of a moratorium, think the state should help them organise the sale of their products. It was often mentioned that two years ago the potato harvest was unsold and rotted away and that agricultural produce is sold at a low price and does not justify its prime cost. According to the respondents, there is no good marketing system able to organise a search for markets. Thus, respondents consider sales as the main problem of agriculture. The high level of disease among animals and a weak veterinary service and insufficient forage stocks and the inaccessibility of pastures were other important problems followed by: expensive petrol, oil and lubricants, less livestock-breeding, shortage of work space, deterioration of equipment, high cost and shortage of quality seeds, shortage of irrigation water and insufficient assistance from the state in developing livestock-breeding, a need for advisory services in the agricultural sector and on legal issues (loans and mortgage law), veterinarian services and livestock experts.

Respondents are waiting for assistance from the state and international organizations just to solve these particular issues and think that such assistance would help the population find alternative sources of income.

In the course of FGD it was clarified that the group of new fishermen is ready not to fish at all if they had other sources of income and earlier they were engaged in agriculture and want to return to this sector, whilst hereditary fishermen would be very happy to engage in fish-breeding. For example, in the village of Oriukty they showed the researchers a brook where local fishermen would like to set up a mini fish farm to breed trout, white-fish and other species of fish.

People engaged in processing and fish sellers consider their business damages their health and are ready to do other things if suitable assistance could be given to them to find other types of activity.

It should be noted that over half of the respondents (52%) are pinning their hopes on assistance from the state in the event of a moratorium, showing they live in a 'nanny state' and the weak development of civic motivation, but it should also be noted that the population, which has been cheated by the state many times, doesn't believe in the reality of assistance from the state and consider that without the assistance of international organizations the problem of finding alternative sources of income and retraining would not be resolved.

At the second seminar in the course of group discussion on alternative sources of income attended by of scientists, representatives of LG, NGOs, fishermen and people engaged in processing, the following was suggested: where possible, musk-rats, carp and ducks should be bred; ponds should be developed; peat should be dug and packaged for seedlings; fish-farms; all types of tourism should be developed, sport fishing and hothouse market-gardening.

7. SOLUTIONS TO CONSERVING ENDEMIC FISH SPECIES

Analysis of summarised research data revealed the following reasons for the reduction in endemic species of fish:

- Mass poaching determined by the difficult economic and social situation in the province (mass unemployment in lakeshore villages, difficulties in setting up small and medium-sized enterprises, etc.)
- At present fishing, processing and selling fish are the only sources of money in family budgets for a significant part of the population in the province.
- Reduced spawning areas (water-level fluctuations in the lake; some areas are covered with litter).
- The lake is polluted as a result of anthropogenic activity, including pollution of the lakebed with old nets, plastic and glass bottles, etc.
- Lack of attention to fish reproduction issues.
- Over-fishing, including catching young fish.
- Eating endemic fish roe and young fish by other species of fish.
- Corruption and inefficiency of work of controlling bodies.

Experts' opinion

All the experts expressed concern about the problem of conserving endemic fish stocks in the lake, particularly marinka, osman and sazan that should be allowed 15-20 years to re-establish themselves. Experts think that this problem can be resolved not only with the help of a total ban on fishing for these species, but by breeding them as well.

Some experts express the opinion that the existing system of sharing the distributing, controlling and punitive functions between different agencies results in complete inefficiency of the whole package of environmental legislation and makes arrangements to repair the damage and preventive measures related to the ecological state of natural objects, impossible.

They are also of the opinion that in some cases fish-factories went commercial to meet public demand and it is necessary to completely revise the concepts and main priorities of the existing fishing industry on Issyk-Kul Lake.

In the course of discussions many experts and fishermen expressed the opinion that the law on fishing must be changed, especially with regards to bans due to the impact of weather and they feel that the closed season should correspond with natural processes, be scientifically based and not depend on officials' wishes.

Two ways were suggested by experts as positive models of reproduction:

1. Establish a central fish-farm aimed at breeding schools of female, rare endemic fish based on one of the existing fish-farms.
2. Establish temporary breeding units, located directly on the lake.

In the course of their activities, researchers received information about a project to breed osman supported by UNDP recently implemented in Ananevsky rayon. Without belittling the project's practicality and the merits of its executors, it should be noted that this project hasn't succeeded due to a whole series of reasons. From our point of view one of the reasons was the inadequate professional level of the executors, which led to the project being short-term, without considering the peculiarities of the

biological development of osman and the fact that breeding males were only introduced after the mass spawning season. Currently, all the expensive equipment for breeding osman is lying in one of the fish-farms of the province.

It should be noted that this was the first project in the country and so some mistakes were inevitable and we should stress it was quite valuable from the point of view of lessons learned and how to improve the elaboration and planning of similar projects. Now it is absolutely clear that the project on the recovery of species having a long biological development cycle can't be short-term and it should run for not less than 5 years. A professional team consisting of a number of fish experts and fishermen should be involved in implementing such a project and the period of implementation should correspond with the biological development cycle of the fish.

Experts consider organising large-scale educational activities amongst the population as another important direction of work on preserving endemic fish stocks. It was proposed that materials be prepared for different layers of the population and different mass media used: articles in newspapers, TV demonstrations and internet websites, as well as special programmes for school children and adults. From the experts' point of view giving the population information about the threat of the disappearance of endemic species of fish would help create a caring attitude to natural resources by the population.

Opinion of the population
The survey showed that on the whole, the population has no particular understanding of the issues related to preserving endemic fish species and for many it was the first time they had heard the term endemic, so the population and fishermen's proposals have been reduced to the need to ban fishing during the closed season.

Experience of Baikalsky fish experts
In the course of investigating the problem researchers discovered several interesting methods used by Russian fish experts to conserve disappearing species in Lake Baikal.

One of the methods is ex-stai, i.e. developing fish-farms to artificially breed young fish and then releasing them in natural ponds and establishing cryobanks. As an example they mentioned the experience of conserving umber in the rivers on the Irkutsky shore of Lake Baikal. Under this project, fertilization and incubation of fish roe takes place at the fish-farm and after the hatching of grubs in devices, they are delivered to special sites, where work on preventing them being eaten has been conducted. The grubs grow and are fed at these sites, which are protected from other parts of the lake by special sand and gravel dams. Then, after the young have grown up, the dam is destroyed and the young fish can swim into the lake. A cryobank of male fish sperm has been set up and schools of females are supported to preserve the genetic fund of umber. The schools of females are replaced periodically by fish living in natural conditions.

Researchers think that this approach, i.e. establishing cryobanks and fish-farms at the same time would promote the preservation of genetic species of endemic fish, which are in a precarious situation and establishing cryobanks reduces the cost of supporting the population at the expense of reducing the number of male fish. International experience and cooperation would be necessary to establish such a bank.

Overall, the following can be summarised:
- There are several groups engaged in the fishing industry: hereditary fishermen, new fishermen and people engaged in processing/selling fish.
- The most positive attitude towards preserving endemic fish species is demonstrated by hereditary fishermen and less by the other groups – new fishermen and people engaged in processing/selling fish.
- Relations between representatives of the fishing industry and controlling bodies are a serious source of corruption.

- The ineffective work of controlling bodies is linked to: the complexity and mess of the segregation of authorities that requires a functional analysis that reveals duplicated functions; systemic corruption; poor equipment and low wages of employees; difficulties imposing fines in accordance with Article 149 of the Administrative Code; inadequate professional level of full-time and freelance employees and other reasons;
- Overall, from 1,000 to 1,500 households in the province are engaged in the fishing industry and in focus villages about 43% of households;
- The percentage of income from fishing in aggregate household incomes is 13.56%;
- The average monthly income of a fisherman comprises is about 1,400 KGS and people engaged in processing/selling fish – 1,900 KGS;
- Income obtained by the population from the fishing industry accounts for about 2.6 million KGS per year in the province;
- The income of the population of focus villages does not let them save any money to purchase durable goods and pay for their children's education in higher education institutions;
- Endemic species of fish – chebak and chebachok are in popular demand in the market;
- The majority of interviewed experts are against a total moratorium and support a partial moratorium on fishing, two third of interviewed population support the introduction of a partial moratorium on fishing, whilst about 20% think it is necessary to impose a total moratorium;
- The population supports the introduction of a moratorium on fishing for trout, white-fish, osman, chebak and marinka;
- On the whole, the population and experts are too pessimistic about the possibility of imposing and enforcing a moratorium, especially a total one;
- With regards to a total moratorium some experts and fishermen think there is no reason to adopt the law, which is doomed to failure beforehand;
- The reaction of the population to the introduction of a moratorium would be ambiguous: groups, which are not engaged in the fishing industry would be indifferent to the imposition of a moratorium and there would be no reaction to its imposition; the majority of new fishermen and people engaged in processing would treat the moratorium in a negative way, of them 1/3 do not intend to observe the moratorium; hereditary fishermen are the keenest to impose a moratorium;
- The majority of respondents (83%) think that residents of their villages would be against the imposition of a total moratorium and wouldn't support it and 69% of respondents think that their community would support the imposition of a partial moratorium;
- The majority of respondents in surveyed villages (74%) think that widespread protests in connection with the introduction of a partial moratorium would probably not take place and about a quarter think that some sort of protests might take place;
- The majority of experts think that in the process of converting to alternative sources of income the population could not manage without the assistance of the government and external donor assistance;
- The following were proposed as alternative sources of income: get fishermen to breed fish; organise fish farms; develop ponds (fish, carps, ducks, musk-rats, etc.); livestock-breeding; hothouse market-gardening; opening workshops; digging and packing peat for hothouses and flower-growing at one of the lakes of the province; develop all types of tourism and sport fishing;
- A significant role in the search for and promotion of alternative activities and converting to them should be entrusted to the local administration and local governance bodies; at the local level there is the capacity, interest and desire to resolve this problem.

8. RESEARCHERS' OPINIONS AND IMPRESSIONS

Summarising the work of the project, researchers reached the conclusion that not one of the existing structures would be able to resolve the problem of preserving endemic species of fish of Issyk-Kul Lake alone, because the problem is not just ecological. It is interwoven with the social problems of the province, way of life of residents of lakeshore villages and their mentality and social consciousness, so success would only be guaranteed through a complex approach with widespread support from partners and stakeholders.

At the same time, the existing level of development in the province and country as a whole means this problem cannot be resolved without the assistance of donor and international organisations. Ideally, the project should involve a combination of efforts by various international and donor organizations, where one could work on converting people to alternative sources of financing, another one improving the awareness of the population and the third one in direct activities on breeding endemic species of fish and improving transparency and eliminating corruption in State institutions. It is expected that all participants in the project would be equal partners.

Scientists and first of all, representatives of the Issyk-Kul bio station, who have been studying and working with the fish of the lake for many years, should play an important role in the project. Their opinions on reproduction issues, the possibility of organising pond units, selection of species, etc. should be paramount, because unscientific intrusion by human beings into the ecological system could upset the existing balance.

A special role should be given to environmental organizations, whose main task is providing observance of environmental legislation, its reform and compliance with new realities and situations.

Of no small importance is the input that should be made by organisers of the fishing industry, whose position influences public opinion and could become an example to residents of communities. However, according to researchers the most important role should be given to the population living on the lakeshore. Meetings with fishermen, people engaged in processing and other people showed that the majority of them are unaware of the critical state of endemic fish species and almost all of them are not aware of what endemic means and that in Issyk-Kul Lake there are species of fish, which are not found anywhere else in the world. From our point of view providing information to the population in combination with converting to alternative types of activity should have a good effect. This is supported by the fact, that when in the course of field work respondents have been told of the problem of reduced numbers of endemic fish species and the uniqueness of chebak and chebachok, which are normal fish for them and that these species do not live anywhere else in the world, ordinary people became upset and began to worry that endemic species of fish could be lost to their children and grandchildren. When researchers spoke about possible assistance from international organisations while converting to other sources of income, many villagers wanted to make their own contribution to preserving endemic fish species for future generations.

Finally, the researchers wish this project, which is important and necessary for Kyrgyzstan every success, which would mainly depend on inter sector collaboration and equal partnership between all participants.

ANNEX. LIST OF EXPERTS

1	Alyshpaev Kalybek Keneshevich	First Deputy Governor of Issyk-Kul Province
2	Karabalaev B.M.	Deputy Akim of Issyk-Kul Rayon
3	Bukarova Anara Kudaibergenovna	Acting Head of Issyk-Kul Province Department for Preserving the Biodiversity and Manging the Use of Bio resources
4	Arynov Avasbek Japarovich	General Directorate of the Biosphere Area
5	Lysenko Sergey Sergeevich	Issyk-Kul Biological Station of The National Academy of Sciences of the KR
6	Konurbaev Azat Omurzakovich	Aleine Ecological movement
7	Salmakeev Dolotbek Sydykovich	Oblast Environmental Protection Committee
8	Atantaev Jetimish	Director of, Kara-Shaar School
9	Kanietova Burul	Assistant in the Kara-Tal Ayl Okmotu
10	Tashmatov	EDITA NGO
11	Kasymaliev Talai	Editor of the news department, Youth Ecological Television
12	Aleksandrov Yuri	Syrdash
13	Kabataev Dokturbek Turgunbaevich	Balykchilar Ltd
14	Rakin Aleksandr	Entrepreneur, Fish Processing Unit Cholpon-Ata
15	Batskalev Nikolay	Director, Mayak sports tourism and fishing centre
16	Makhmetov E.	FINKA Corporation
17	Sveta	Director of the market in Cholpon-Ata
18	Niyazov Beshiken Niyazovich	Head of the Fishing Industry Department of the KR
19	Alpiev Mukhtar Nurakimovich	Head of the fish service sector. Senior research officer.


UNITED NATIONS DEVELOPMENT PROGRAMME
"ENVIRONMENT PROTECTION FOR SUSTAINABLE DEVELOPMENT" PROGRAMME
ПРОГРАММА РАЗВИТИЯ ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ
ПРОГРАММА «ОХРАНА ОКРУЖАЮЩЕЙ СРЕДЫ ДЛЯ УСТОЙЧИВОГО РАЗВИТИЯ»
UNDP
Kyrgyzstan
Кыргызстан

ALTERNATIVE ENERGY
Social Survey

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INTRODUCTION

Today there is a worldwide discussion about and search for ways to develop the energy sector. The driving force behind this process is the need to protect the environment and countries' efforts to base their energy and manufacturing sectors and utilities supply on energy saving and energy efficient technologies. As a result there is an increased interest in the world in renewable energy use in different economic sectors.

In line with this the UNDP Capacity Building and Environmental Governance Strengthening for Sustainable Development project in Kyrgyzstan has initiated a survey in the field of renewable energy that was developed in two stages.

The aim of the first stage (sociological survey) of the survey was to collect and summarise information to develop a draft project document on promoting renewable energy for rural development and the second stage (market research) is identifying the state of and prospects for renewable energy development.

1. SURVEY METHODOLOGY

For detailed elaboration of the survey's content and methodology a special stakeholders' working group, representing state agencies, NGOs and UNDP was established. The survey methodology was based on combining quantitative and qualitative methods of data collection and processing and covered 1,959 people in selected settlements and 40 experts. In selecting households to interview the method of routing selection was used. Ensuring a balanced selection of households.

Experts were specialists promoting renewable energy use in the country.
The working group selected seven key settlements to interview and the following criteria were taken into consideration:

- Prevailing type of economic activity (relevant to the use of renewable energy);
- Lack/shortage of electricity;
- Proximity to protected areas and vulnerable ecosystems;
- Proximity to other UNDP project areas; and
- High co-financing potential and opportunities.

Apart from settlements based on the above criteria the survey was conducted in the most typical settlements at rayon and province levels. Overall the survey was conducted in 24 villages, in each of which 84-86 households were interviewed.

Table 1.1. Survey areas

Oblast	Focal areas	Typical rayon level settlements	Typical province level settlements
Chui	Poltavka village, Jajyl Rayon Yssyk-Ata village, Issyk-Ata Rayon	Kaliniskoye village, Jajyl Rayon Krasnaya Rechka village, Yssyk-Ata Rayon	Romanovka village, Soculuk Dist Besh-Kungey village, Alamudun Dist
Issyk-Kul	Darhan village, Jety-Oguz Rayon	Tamga village, Jety-Oguz Rayon	Sary-Kamysh village, Ak-Suu Rayon
Naryn	Kaiyndy village, Naryn Rayon	Jan-Bulak village, Naryn Rayon	Dyjkan village, At-Bashy Rayon

Talas	Nyldy village, Manas Rayon	Pokrovka village, Manas Rayon	Kara-Suu village, Kara-Bura Rayon
Osh	Myrza-Ake village, Uzgen Rayon	Jylandy village, Uzgen Rayon	Karatay village, Kara-Suu Rayon
Jalal-Abad	Arkit village, Ak-Sy Rayon	Atana village, Ak-Sy Rayon	Orto-Asia village, Suzak Rayon
Batken		Kara-Suu village, Lajljak Dist, Uchkor-gon village, Kadamjay Rayon	Bujum village, Batken Rayon
Total	**7**	**9**	**8**

2. KEY FEATURES OF SELECTED COMMUNITIES

Social and demographic characteristics of respondents

51% of the questionnaires were completed by women and 49% by men. The average number of household members is 5, 1.7 of whom are employed. In poor households the number of employed is 1.37, in middle class households - 1.81 and in rich households – 2.5. Age and educational characteristics are shown in Diagrams 2.1. and 2.2. below

Diagram 2.1. Age distribution of respondents

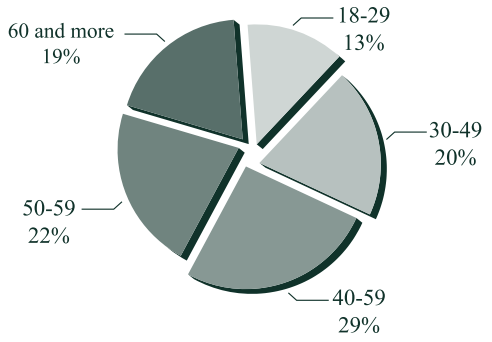
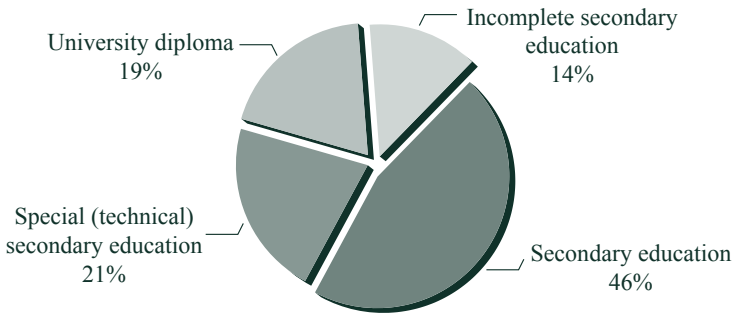


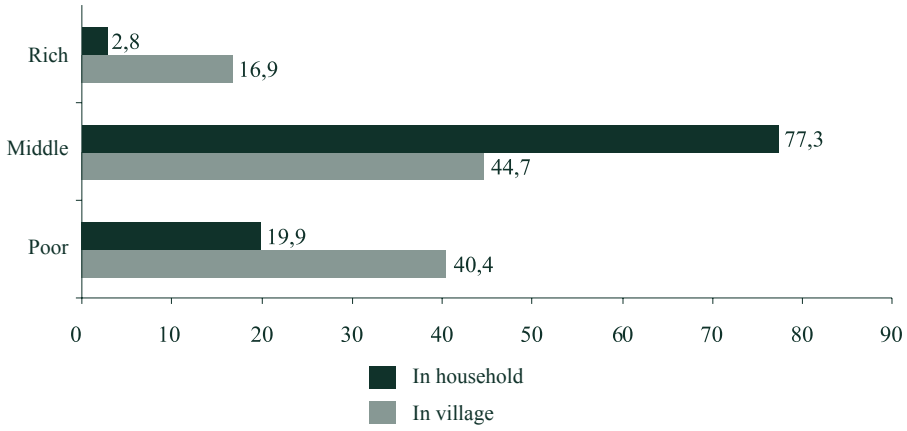
Diagram 2.2. Educational level of respondents



Subjective poverty line

On average, according to respondents' data, about 40.4% of the population live below the poverty line in the surveyed settlements, however, when assessing their own households' poverty level, respondents classify themselves as middle class rather than poor, which seemingly reduces the poverty level.

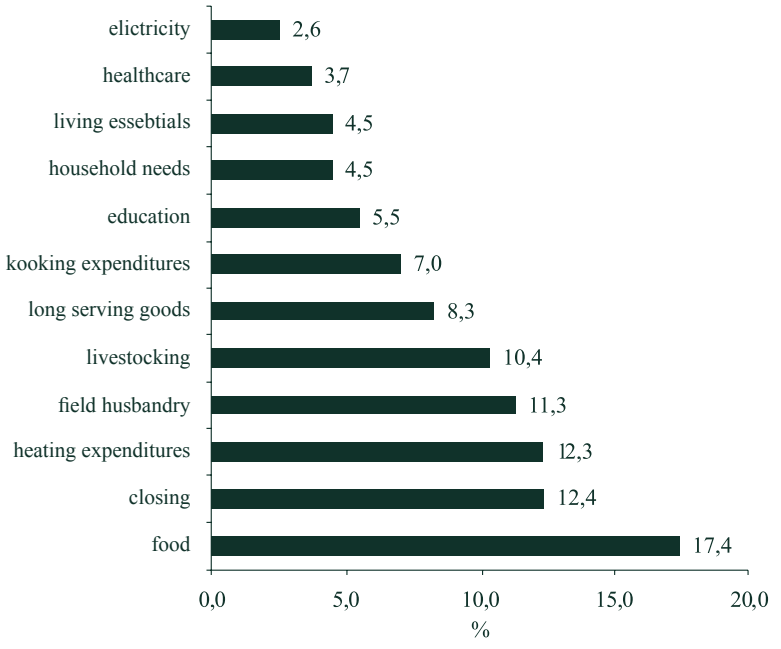
Diagram 2.3. Average subjective poverty assessment (%)



Breakdown of annual expenditure

An analysis of the average household expenditure data of the surveyed villages shows that it contains 12 main items (diagram 2.4.) with most money being spent on food - 17.4% of annual income on average.

Diagram 2.4. Breakdown of average annual expenditure



Housing characteristics

Most houses (56%) in the surveyed settlements were thatched and more rarely of brick (35%). Frame and other type houses are rarely met and comprise no more than 10% of the total. Owners of thatched houses have varying incomes, but this type of housing is more typical of poor households (76%) than for more wealthy households (53%) for whom brick houses are becoming more typical (40%) than thatched (14%).

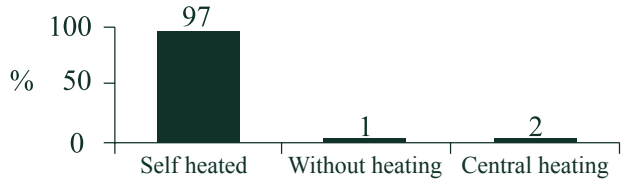
Table 2.1. House characteristics

Poverty level in house-holds		Number of rooms in the house	Area in sq. m	Number of rooms heated in autumn-winter	Area heated part in sq. m	Percentage of area heated (%)
Poor	Mean	3,9	66,5	2,1	29,9	52,9
	Std. Error of Mean	0,1	3,1	0,1	1,6	2,7
	Median	4	60	2	27	44,4
	Minimum	1	12	1	6	6,3
	Maximum	7	160	6	90	100,0
Middle class	Mean	4,5	81,1	2,7	38,1	56,6
	Std. Error of Mean	0,1	1,8	0,1	1,2	1,5
	Median	4	80	2	30	47,1
	Minimum	1	8	1	6	5,4
	Maximum	10	190	10	160	100,0
Rich	Mean	6,6	106,9	4,0	65,9	64,0
	Std. Error of Mean	0,5	8,0	0,5	8,4	7,4
	Median	6,5	102,5	4	60,5	60,2
	Minimum	4	52	1	12	7,1
	Maximum	10	178	9	151	100,0
Total	Mean	4,5	78,9	2,6	37,3	56,1
	Std. Error of Mean	0,1	1,6	0,1	10,	1,3
	Median	4	80	2	30	46,5
	Minimum	1	8	1	6	5,4
	Maximum	10	190	10	160	100

Table 2.1. shows that houses at various poverty levels vary considerably in size and by area heated in autumn-winter. For instance, the average number of rooms in poor households is 3.9 with an average area of 66.5 m2, of which only half is heated in winter - 52.9% of the required heating level, middle class households have 4.5 rooms with an area of 81.1 m2, of which 56.6% is heated and rich household have large houses of 6.6 rooms, 64% of which is heated.

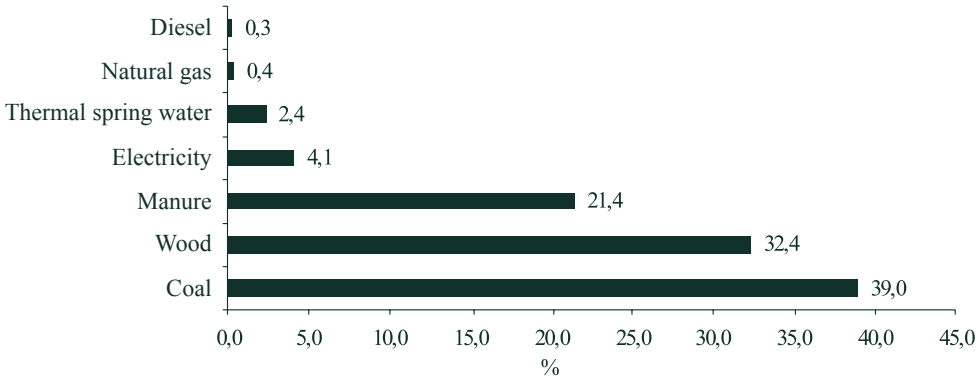
Based on the above it is possible to state that heating of only part of houses is normal for most of the surveyed households and only 26% of respondents said that they heat the entire house in winter.

Diagram 2.5. Type of heating



Type of energy and equipment used for heating
The survey discovered that most respondents have separate heating systems using various fuels (Diagram 2.6).

Diagram 2.6. Type of fuel used for heating houses



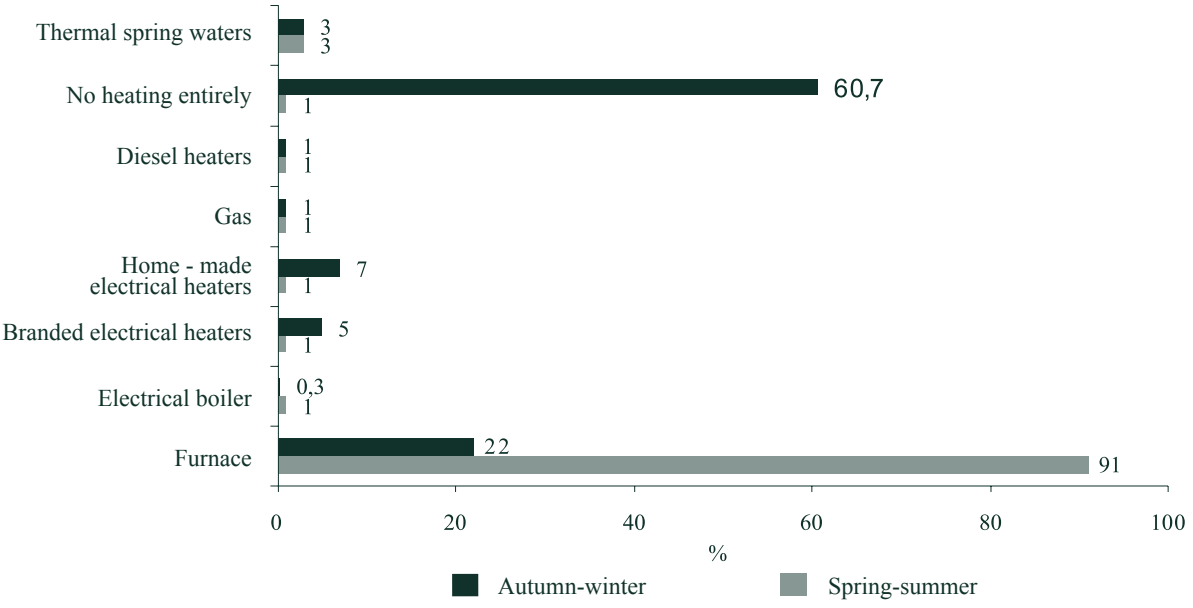
The majority of households use stoves (91%) in the winter and very rarely, no more than one in a hundred, use electric boilers and gas and diesel heaters. However in spring-summer, when stoves are not usually used, homemade or branded electric heaters are used at night.

Energy sources used for heating in the surveyed settlements have certain peculiarities. For instance, in Yssyk-Ata all households use thermal spring water for heating, but the supply system is in a very bad state resulting in huge heat losses. The water temperature at the entry point to the system is 54oC, but end users receive 35-38oC, which is why respondents are forced to use additional electric heaters and ovens.

Another special settlement is Arkit village located in the Sary-Chelek Reserve. All houses here use wood for heating and only a few combine it with manure and only one household has a very old stock of coal, which is used in extremely cold weather and only one other household has a diesel generator.
Gas heating is used only in Romanovka in Sokuluk Rayon and diesel heating in several households in Kalininskoe in Jayil Rayon. It should be noted that there is a mini hydroelectric plant in Kaliniskoe and its electricity is fed into the national grid operated by the state utility company JSC Severelectro, which is why villagers don't know whether or not they use locally generated power.

The most popular combination of fuel is wood, manure and coal depending on a household's income. In rich households wood + coal is more common and for poorer households, wood + manure is more typical.

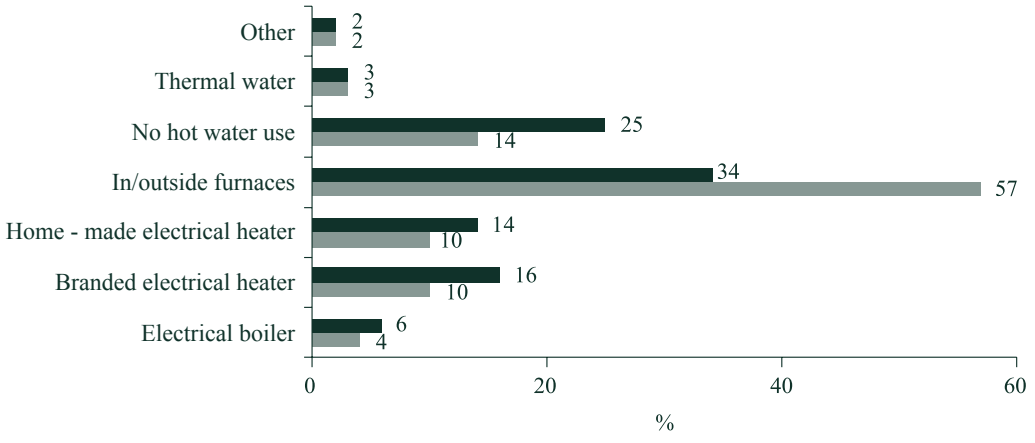
Diagram 2.7. Equipment used for heating



Water heating equipment

Analysis of the obtained data shows that the most popular way to heat water is by indoor or outdoor stoves (Diagram 2.8).

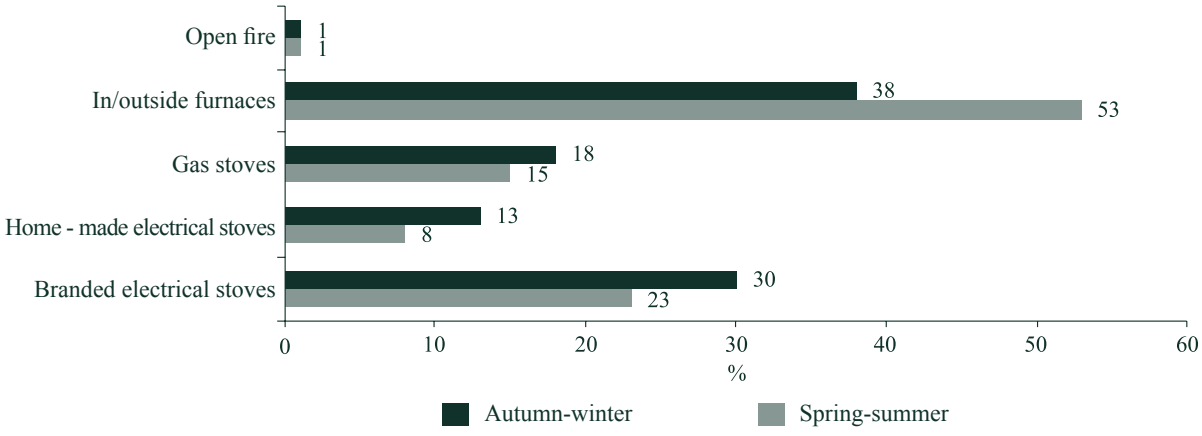
Diagram 2.8. Water heaters



It should be noted that in autumn-winter stoves are used more for water heating (by 23%) and in spring-summer electric water heaters are used 6% more than in autumn-winter. In spring-summer many households (25%) don't heat water and keep it in tanks that are naturally heated by the sun. Very often households use homemade heaters and boilers. Thermal water in all seasons is used only in Yssyk-Ata.

Cooking equipment

Diagram 2.9. Equipment/method of cooking

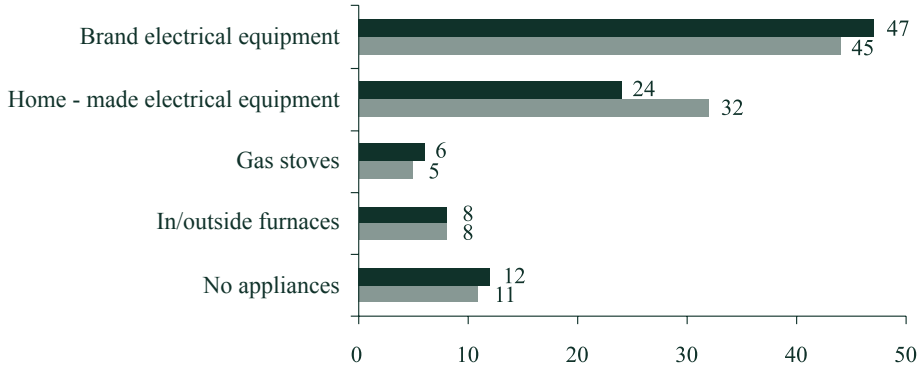


The survey shows that regardless of the season, most households use indoor/outdoor stoves for cooking (38% in spring-summer and 53% in autumn-winter). Since in winter indoor stoves are stoked at least once a day, they are used for both cooking and water heating. From a quarter of households in autumn-winter to one-third in spring-summer use electric stoves, one-third of which are homemade, for cooking. Gas stoves are used less frequently (15-18%).

Equipment used in households

According to the survey nearly half of households don't have any energy consuming household appliances. Where premises need to be heated or hot water used when livestock are born, domestic stoves or electric heaters are used.

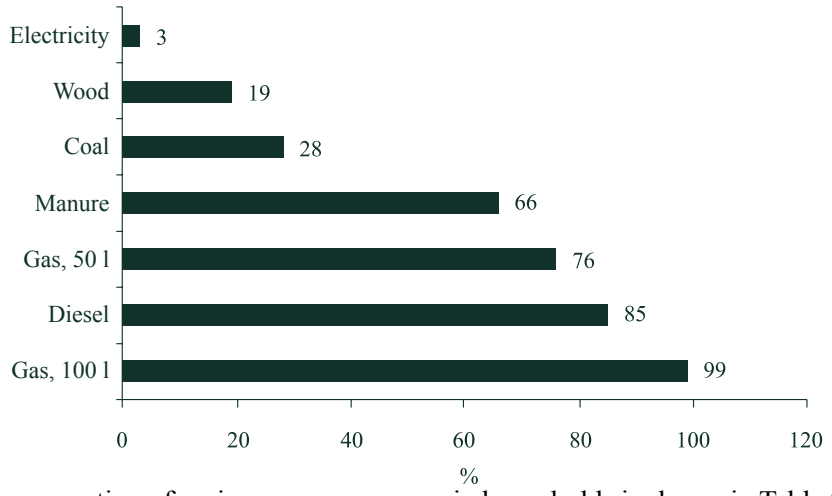
Diagram 2.10. Household appliance use (%)



Annual consumption of various forms of energy

Survey data show that overall in surveyed settlements the most commonly used energy is electricity (99% of households). Firewood is used in 85% of households, coal – 76% and manure – 66%. Gas is rarely used, especially in 100 litre cylinders and even more rarely is diesel used, especially as fuel for heating. Kerosene in households is usually used for kerosene lamps (when there is no electricity) or to light stoves quickly.

Diagram 2.11. Frequency of use of various energy sources



The average annual consumption of various energy sources in households is shown in Table 2.2. Annual consumption of firewood is on average, 2.1 m3. Some households (15%) either due to being far from forests and bushes or having thermal water as an energy source don't use firewood at all (Yssyk-Ata, Pomanovka, Kara-Dobo). However, the closer villages are located to forests, the greater is the consumption of firewood. For instance, in Arkit annual firewood consumption per household is from 4-5 to 10 m^3.

Table 2.2. Average annual energy consumption

	Fire wood (m^3)	Coal (tons)	Manure (kg)	Electricity kWt/h	Gas (50 l cylinder)	Gas (100 l cylinder)	Diesel (litres)
Mean	2,139357	1,7911179	1126,3644	1965,8277	6,155914	1,5555556	21,35772
Median	2	2	500	1500	5	1,5	4
Minimum	0	0	0	500	1	1	1
Maximum	10	6	20000	10000	24	3	1000
Std. Deviation	1,49658	1,4818578	2332,2345	1638,4954	4,513331	0,6156988	114,5758

On average, each household in surveyed settlements consumes 1.79 tons of coal, which is more often bought by wealthy households, whilst a quarter of households (24%) don't use coal. In settlements close to forests, households don't use coal, because of easy access to firewood and manure.

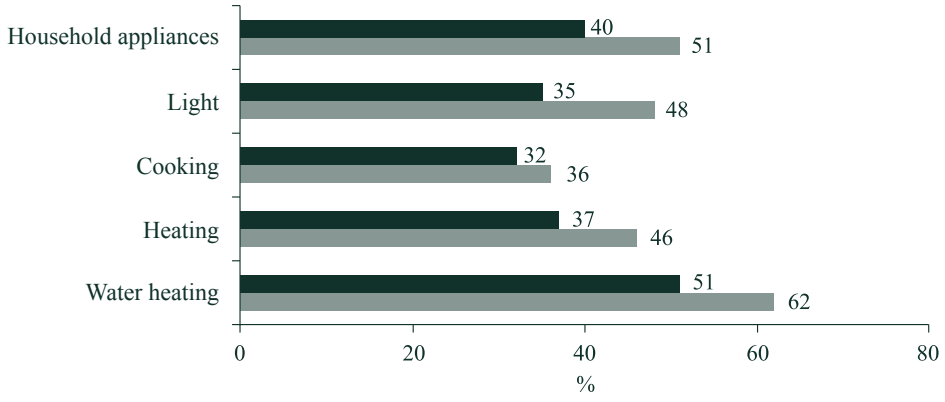
Manure is widely used as a fuel by a considerable number of households (76%). The standard deviation of this element is quite large and proves its widespread use. Among the surveyed settlements, all households in Naryn Province, where this energy source is more popular, consume 5-8 tons of it annually.

Annual electricity consumption per household is on average 1965.8 kWt/h. There are households that don't use much electricity (500-900 kWt/h), because of widowhood or household owners are elderly. Electricity use is not even and varies greatly, e.g. some households using electric boilers and heaters may consume 10,000 kWt/h annually.

Households using gas usually use 50 litre cylinders and 100 litre cylinders are seldom used because of its price and the compatibility of the majority gas stoves with 50 l cylinders. The average household using gas consumes 24 x 50 l cylinders annually.
Many households use diesel and kerosene for lighting stoves and other household needs and consume up to 10 litres annually. When diesel is used for heating up to a ton can be used but on average 24.3 litres of diesel is consumed by each household.

Energy sufficiency
The survey shows that 48.6% of respondents suffer shortages of energy supplies in autumn-winter and 39% in spring-summer. Seasonal shortages of energy supplies by season is shown in Diagram 2.12

Diagram 2.12. Energy shortages



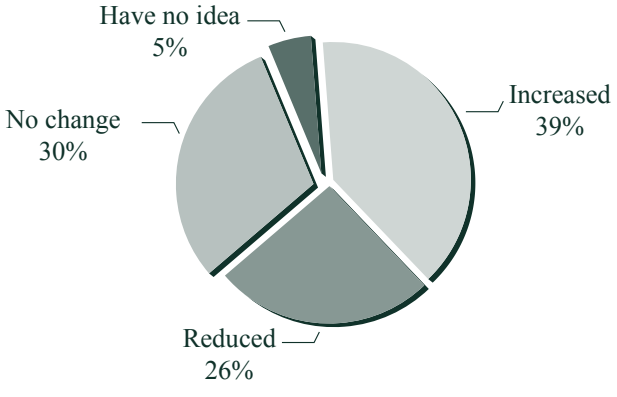
The data show that there are seasonal shortages for lighting, domestic appliances and water heating needs.

Almost all respondents (94%) complain of very frequent power cuts and 95% about voltage surges and all households complain about higher tariffs.

Among other reasons for dissatisfaction respondents very often mention the high cost and low quality of coal, the high cost of firewood and the need to spend a lot of time stocking up with firewood.

Relation to environmental issues
Two-thirds of respondents found that the climate in their location has changed within the past 15 years. 34% of them think that winter has become longer and 20% shorter. The opinion of respondents on the levels of precipitation is shown in Diagram 2.13.

Diagram 2.13. Respondents' opinion on changes in levels of precipitation



According to respondents' opinions timber is cut in the mountain (35%) and riparian (19%) forests and by the roadside (30%). Overall, more than half of the respondents think there is a need to undertake measures to preserve forests for future generations, whilst a comparably large group (28%) think that people face problems since they have no other way to heat and cook and that's why they cut down trees. About 10% don't care about deforestation and 5% have no opinion about it.

Households' features (expert assessment)

Summarising experts' views it can be concluded that the majority of the rural population endure harsh living conditions.

Heating is practised in autumn-winter and almost all households have stoves burning firewood, coal, manure or diesel, which are ecologically damaging.

Almost all households have no hot water supply, which is why water and homes are heated and cooking done on stoves or open fires. The lack of hot water, according experts, leads to poor hygiene and increases the risk of disease.

Experts think that since stoves are usually stoked once or twice a day households often use electric heaters in between stoking and they are usually old energy guzzling homemade coil heaters, old electric kettles and heaters "handed down from grandmother"[3]. All these negatively impact the electricity grid's stability, increase inefficient energy use and are safety hazards.

Experts think that the existing energy supply is not adequate either in terms of electricity or heating/hot water supplies.

There are problems with the volumes and quality of electricity supplied. Transmission lines are worn out and transformers need rebuilding or modernisation and so, everywhere and especially in rural areas, power cuts are frequent. According to experts, power cuts happen not only because of network failures but also as "preventive measures in bad weather (snow/rain, storms)".

There is a special problem with electricity supplies to farms on remote pastures. "Our shepherds live in the dark ages with kerosene lamps: - What highly productive livestock breeding can we talk about?" - complain the experts and in addition the voltage of electricity supplied does not meet the standards and is very often below that required and sometimes there are voltage surges in the lines.

> *I'm a shepherd and have a lot of animals and I have always lived in the high mountains. I have no electricity and there is very poor radio reception and it is difficult for my wife to cook, launder and bath the children. I would like a mini hydro electric station to generate electricity.*
>
> *Man, JalalAbad Province*

Experts point out that as a result of the existing inadequate energy supply residents ruthlessly cut down trees, even in protected zones, the environment is being polluted, the biodiversity is being reduced and the natural ecological balance is being disturbed..

[3] Here and hereinafter quotes by respondents are virtually unedited

3. ENERGY CONSUMPTION IN HOUSEHOLDS - READINESS OF THE POPULATION TO USE RENEWABLE ENERGY

Energy consumption for lighting

The survey shows that on average each household uses 6.29 bulbs of 681.46 watts annually. The number of bulbs relates to the level of households' income. For instance, in poor households the average number of bulbs is 4.74 and in wealthy households – 10.59 and the average bulb used is of 156 watts.

Energy consumption for household needs

Data on the number of domestic appliances and frequency of use are shown in Table 3.1.

Table 3.1. Number and frequency of use of domestic appliances

	Frequency of use %				
Type of equipment	**Have**	**Constantly**	**1-3 times a day**	**1-3 times a week**	**Occasionally /month**
TV	94.7	75.4	23.5	1	0.1
Iron	82.4	1.2	10.4	46.5	30.9
Electric stove	7.8	40	43.6	9.2	7.2
Refrigerator	61.8	96	0.2	1.3	2.5
Audio player	44	33	26	31.6	9.4
Washing machine	39	9.5	2,4	32	56.1
Gas stove	30.6	31.5	27.5	19.5	21.5
Electric water heater	28.1	30.6	22.4	32.2	14.8
Electric oven	26.8	6.3	8	68	17.7
Video player	15.1	8.2	16.3	39.8	35.7
Music Centre	14.7	29.1	24	32.3	14.6
Vacuum cleaner	12.9	7.1	4.8	50	38.1
Electric hair rollers	11.8	7.8	3.9	53.2	35.1
Electric Telephone	10.2	86.4	7.6	3	3
Hair dryer	9.2	11.6	5	56.7	26.7
Computer	4	15.3	23.1	46.2	15.4
Microwave oven	2.9	5.3	31.6	52.6	10.5
Kitchen unit	1	16.7		33.3	50

Data on average electricity consumption are shown in Table 3.2.

Table 3.2. Average electricity consumption by type of appliance

Equipment	Average watts	Std. Deviation
Iron	828.48	389.06
Electric stove	784.07	492.88
Gas stove	612.56	922.13
Water heater	281.78	453.37
Electric oven	160.80	265.82
Vacuum cleaner	130.17	341.10
Refrigerator	126.19	101.49
TV set	97.55	30.22
Washing machine	77.79	98.15
Microwave oven	37.83	218.56
Hair dryer	27.57	86.68
Hair roller	23.58	64.52
Audio player	22.05	24.83
Music centre	14.70	35.42
Video player	7.58	18.15
Kitchen unit	4.59	47.72
Computer	3.98	19.56
Electric Telephone	1.03	3.09

Average maximum power output per domestic appliance is 3,297.85 watts, average – 2,950.0 watts, N=1860. Power distribution is also uneven and varies from 100 to 10,660 watts depending on the level of wealth of households.

Table 3.3. shows data on average weekly energy consumption by households

Table 3.3. Average weekly energy consumption per household, kwatt/h

Type of surveyed settlement	Average energy consumption	№	Std. Deviation	Minimum	Maximum	Median
Focal	39394,9482	579	25379,50842	2000,00	93450,00	34375,0000
Typical	42513,6971	1347	26212,91020	2000,00	107375,00	33550,0000
Total	**41576,1293**	**1926**	**25997,98940**	**2000,00**	**107375,00**	**33850,0000**

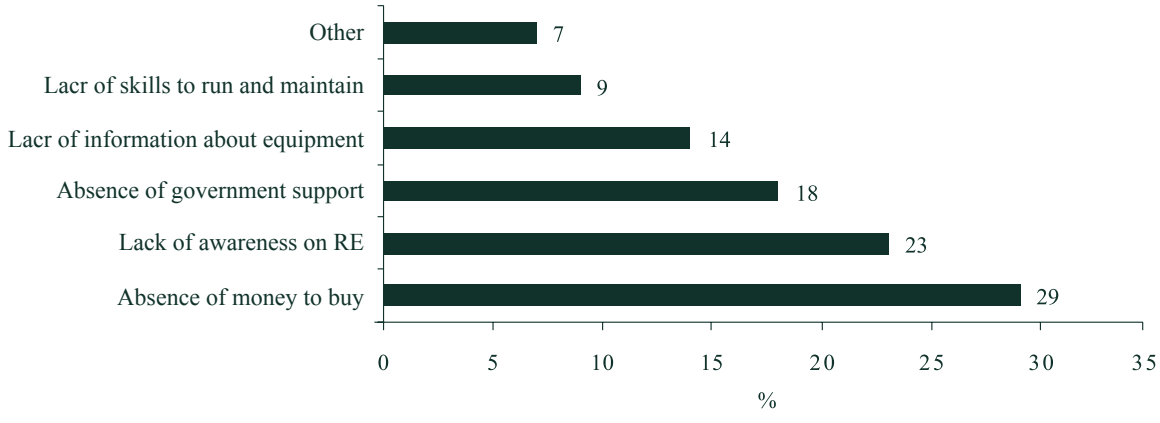
Annex 1 contains the norms of energy consumption compared to 1988

Readiness of the population to use renewable energy

76% of interviewed respondents think that in Kyrgyzstan it is necessary to develop the use of solar batteries, wind and biogas installations, micro hydropower generation and thermal water energy. Most wealthy respondents - 94% - support this view.

According to respondents, key issues for developing RES in the country are: lack of money to buy the necessary equipment (29%), lack of awareness of RES (opportunities, advantages and capacities) - 23% and lack of knowledge of types, technical features and traders of the necessary equipment (37%). Among other reasons mentioned were the absence of government support and promotion of RES (18%) and lack of skills and fear of running and maintaining equipment (9%).

Diagram 3.1 Key issues in developing renewable energy sources (opinions of respondents)



People are ready to integrate RES, because they have become the owners of land and businesses. Farmers are quite substantial and they can co-finance up to USD 1.5 thousand each. They have been privatising remote livestock farms and living with no electricity for 10-15 years.

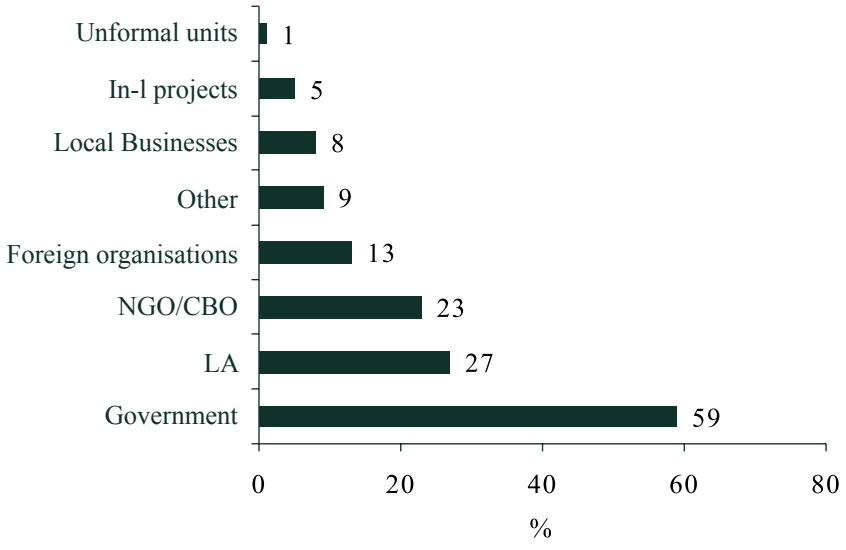
Expert, Bishkek

Almost all respondents are willing to use RES in their households. It was found that respondents with technical backgrounds are more interested in using RES in households than respondents with other backgrounds.

In the meantime respondents with non technical educational backgrounds and women are afraid to install RES at home. According to the survey this group of respondents distrusts and is afraid to use unknown equipment at home – "what if it explodes, we have children at home", "what if something goes wrong and we die". Apart from that, some respondents distrust the quality of the supplied equipment, especially solar systems – "I know that most solar heating panels come from China, and who knows how long they will last?"

According to respondents, the Government (59%) followed by local authorities and international organisations should fund the promotion of RES in the country. Interestingly, according to respondents, local businesses would not be interested in investing in RES in the country.

Diagram 3.2. Potential investors in RE[2]



People in the surveyed villages pin great hopes on the assistance of international organisations and their projects (18%), among them UNDP, ARIS, WB rural development projects, Rural Advisory Services (LARC, HELVETAS), poverty reduction projects, USAID, ADB, Mercy Corps, Soros etc.

The survey showed that in most cases (86 % and more) respondents cannot allocate money from family budgets to purchase RES. Biogas installations, on which 14% of respondents were ready to spend from 100 to 40,000.00 soms were the most frequently mentioned. 13% of respondents are ready to co-finance solar heating systems and micro hydro-electric stations (MHS). They are ready to spend up to 100,000.00 soms on MHS and from 100 to 10,000.00 soms on solar water heaters.

[2] LA – Local authorities, In-l – international.

4. RES POTENTIAL. THE MOST PROMISING RES FOR THE COUNTRY

Energy capacity of RE for the Earth is shown in Table 4.1.

Table 4.1. RE capacity of the Earth

Energy sources	Capacity in billion kwatt/h/ year	Power per person kwatt/h/year
Solar	150 000 000	25 000 000
Tidal/wave	70 000 000	12 000 000
Wood	220 000	37 000
Wind	150 000	25 000
Rivers	33 000	5 500
Thermal springs	15 000	341,10

Solar energy capacity
Kyrgyzstan receives 4,640,000 billion kwatt/h/ of solar radiation or 900,000 kwatt/h per person or 23.4 kwatt/h per 1 m 2 of its area and 2,100-2,900 hours of sunshine per year.
At present solar energy in the country is rarely used for individual water heating needs.
Experts rate the availability of solar energy use as very high. There are more than 300 sunny days per annum in Kyrgyzstan and "it is our fault we do not use them"- think the experts, who point out that there are two directions of solar energy use for generating electricity and heating water for heating and hot water. The advantage of using solar energy according to the experts is in its low cost, especially of seasonal equipment and its high safety level and the possibility of producing it using materials to hand.

Tidal and wave energy
The country is landlocked and the tides and waves on Issyk-Kul Lake are not big and are mostly caused by storms and using this energy is almost impossible.

Wood
Forests cover only 4% of the country and in order to preserve the biodiversity it is not recommended to use wood as a fuel. Almost all the experts think there is a need to reduce firewood use, which exceeds all possible environmental norms.

Wind energy
The wind energy capacity of the country has been identified as 2 billion kwatt/h per year or 400 kwatt/h per person. Average annual surface wind speed in the valleys 10-20 m above the surface is 2,5 m/s. however for wind generators more than 4-5 m/s is needed.

Experts think that effective use of wind energy is possible on the mountain passes and in the mountain ranges, where there are approaching 7,000 hours per annum of usable wind, which could provide 2,000 kwatt/h of electricity per 1 m2. However, generating this energy would require huge investments in generators and electricity transmission lines, which make its use unfeasible. Other than that there are such negative features for its use as instability and direction variability, which is why many experts think that using it is not very promising for the country. Currently, there is practically no wind energy used in the country to generate electricity.

Energy capacity of rivers
According to experts, data on hydro-electric generation based on small hydro-electric stations was extensively developed in Soviet times, when more than 200 MHS of 10-100 Kwatt/h were developed in many places throughout the country and at that time the hydro-electricity capacity of rivers was assessed. However that assessment didn't count rivers with flows of less than 400 l/sec. Rivers assessed for hydro-electricity capacity were chosen based on the requirements of the hydro-electric industry.

The overall identified hydro-electricity capacity of the country on 268 assessed rivers, 97 large canals and 18 reservoirs was about 28,000,000 Kwatt by rating and 246 billion Kwatt/h per year at average flow levels.

Per capita hydro-electric capacity is 5.6 Kwatt by rating and 50,000 Kwatt/h of electricity per year. The flow of small rivers in winter is only 25-40% of the summer level.
The potential of MHS is assessed by experts as very high, especially for remote high mountain villages and farms and positive arguments for using MHS include the following:

- Power supply to remote and isolated villages
- Advantage of very short transmission lines
- Frees -up electricity for export
- Saving maintenance and operation costs on transmission stations and the network
- Independence from a single electricity supply system.

Energy capacity of biomass

Livestock rearing and other human activity wastes of organic origin can be specially treated and could be converted to 1.6 billion m3 of methane annually and the availability of this type of energy is very high. Key advantages of biogas use are:

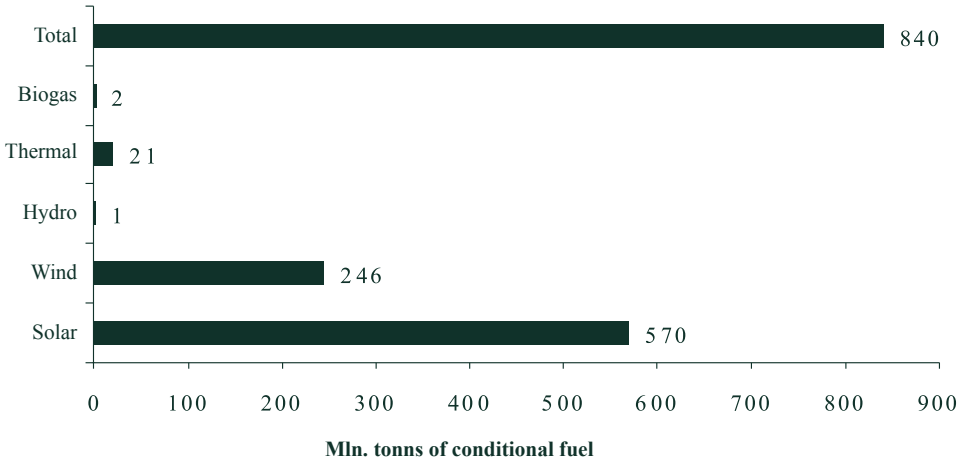
- Presence of raw material – Kyrgyzstan is traditionally a livestock breeding country and livestock numbers are increasing;
- Opportunity to solve the problem of the lack of fertilisers and soil fertility rehabilitation;
- Improved living conditions and sanitation in households;
- Improved ecological situation: less pressure on the environment through additional energy and reduced carbon and other polluters' emissions
- Relatively inexpensive compared to other RES
- Ordinary farms and households can use it
- There is an interest in and will to use it among the population.

Thermal springs

The capacity of thermal springs with temperatures of 40-60 C o in the country is more than 600 mlnGgJ per year and soon it will be possible to utilise thermal water of 170 thousand GgJ per year.

The availability of thermal water is not high, because its use is limited to its sources. The overall and usable capacity of RES in the country is shown in Diagram 4.1.

Diagram 4.1. Energy capacity of RES in the country in million tons of conditional fuel



However the most promising RES for development in the country, according to experts, are: biomass, solar and then small rivers.

5. PROBLEMS IN PROMOTING AES

Based on the data obtained during the study, barriers to promoting AES can be tentatively divided into several groups: legislative, economic, scientific and technological, psychological and informational.

Legislative barriers

- Lack of goals and priorities for AES identified by the government and uncertainty about its prospects;
- Lack of laws and regulatory by-laws guaranteeing independent producers free access in practice to the national electricity grid;
- Monopoly of national grid;
- Corruption in the energy sector;
- Lack of a relevant legislative base and incentives for investors.

Promoting AES requires political will and a political situation, if they are in place – investors will come and to achieve this, the government must give support in terms of tax, legislation and financial mechanisms.

Expert, Bishkek

Many experts note the need for a state long-term energy sector development programme with AES being identified in it as one of the priority areas. Currently no government body is promoting AES, however there are some small organisations working independently, therefore there is a great need for coordinated efforts in this area and currently, the "state's attitude towards AES is unknown and it's still unclear how the government sees AES".

Experts believe that laws should be developed to oblige energy companies and industrial enterprises to support AES, which must take into account the interests of and benefits for energy companies and industrial enterprises.

Overall, AES promotion requires additional legislation regulating connection to the grid, transmission, marketing and tariffs, i.e. a whole set of laws, by-laws and instructions.

Let's suppose I am a big energy man and that I generate 100 units of electricity in Toktogul, which I must transmit to a remote village, i.e. deliver to a consumer. En route I lose 20% and there is no other way. I would rather build an energy source for this 20% and get rid of this consumer and export this 20% and all parties win. This is how it appears but in our psychology this not advantageous to the oblast governor and the oblast power station - their performances and consumption fall, etc. All this must be formed legally and officials must be motivated to work towards this.

Expert, Bishkek

During the study, researchers often received information about the failure of the existing legislation to provide the most important development principle – equality in and access to the market. There are the so called "elite" entities, for whom special conditions have been created and who have special privileges that allow them to stay in the market. During the interviews it was quite frequently mentioned that a condition for entering this elite group is that you have to be a confidante of the establishment and corrupt. Businessmen, who have installed their own MHS (mainly owners of cafés) say that getting licenses to install them took "a multitude of informal additional payments to officials of different levels and institutions". Therefore "businessmen consider that AES users' requirements must be spelled out accurately and specifically in the legislation and the licensing procedure itself must be simplified". In general experts believe a range of laws must be adopted, which should:

- Classify the types of AES, define the parameters and limits of small energy activities, regulate the delimitation of authority between government executive agencies and local self-governance bodies on the use of AES and define the property rights to different types of resources;
- Supplement the Tax Code with a special chapter on the taxation system for producers and consumers of non-traditional renewable energy sources;
- Make provisions in the budget estimate for financing scientific-technical research into AES equipment;
- Develop and adopt a law on animal residues, which will give an impetus to expanding biomass energy use.

We need a law on animal residues, which must say what should be done with them and where they must be stored. Look, there is plenty of animal dung around the farms and villages – this is unhygienic and harms the environment, while it could be used in business

Expert, Bishkek

Economic barriers
- low demand in the market
- low purchasing power of economic entities and the population
- lack of economic incentives to attract investors (such as preferential loans, tax breaks etc.) and a lack of financing and repayment mechanisms and responsibility to investors.

Here the situation with the Kalinin HPS can be cited as an example. According to the experts, the monopolistic ownership of the electricity grids by such a big entity as JSC Severelectro blocks the development of small energy. It is not profitable for MHS entities to construct their own networks therefore they make contracts with the owners of the grid – JSC Severoelectro, which obliges it to pay for the supplied energy. In practice it leads to the total dependence of small entities on a big monopolist, which sets its own rules in the market (terms of payment, tariffs, loss coefficient, etc.).

Work on Kalinin HPS restarted in 1998 thanks to investment by the French company Mecamidi. It is known that for years JSC Severoelectro has been failing to meet its contract obligations to pay for the supplied energy despite this issue having been addressed many times. Today the arrears of Severelectro to Kalinin HPS are about 1,235,145 soms. Although there are contractual commitments, a decision of the Arbitration Court and a Prime Minister's Order to resolve the conflict, this monopolist is still above the law. It should be noted that the launch of the Kalinin HPS was considered by the investor as a pilot investment and it had plans to increase investment in the ensuing years, but as a result of the current situation the investor intends to withdraw from the Kyrgyz market.

Scientific-technical barriers
- lack of an existing energy supply system for AES,
- shortcomings of the existing system in allowing for seasonal AES,
- lack of standards and certification requirements on imported and manufactured equipment,
- lack of human resources for maintenance and qualified scientific-technical staff and locally-made equipment

Experts believe that developing and financing locally-made AES equipment needs government support and they also believe that in order to use solar energy today we need technologies that make less use of silica bricks and perform better and we should have equipment that tracks the sun's movement and install it on solar panels etc.

Experts have also reported big problems in storing solar energy as the main consumption is in the evenings. Modern storage batteries are inadequate and require new technical solutions.

Users of biogas units consider that it is better to install all-year round units and that installed but inactive units should be repaired.

Psychological barriers
- conservatism
- fear
- lack of means
- unwillingness of the population to use AES.

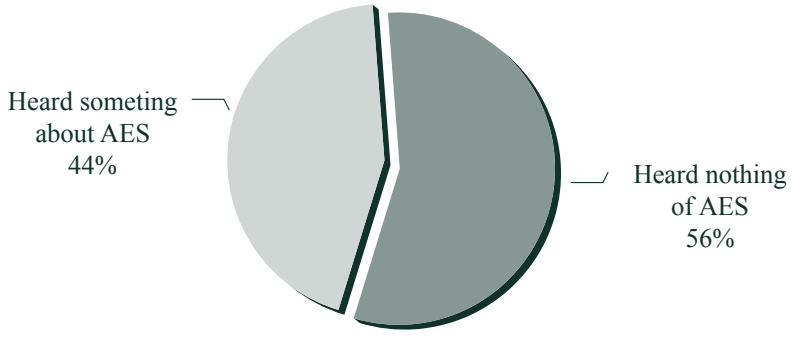
Experts consider that "many people are conservative and don't want any changes in their established and settled ways of production, household activities and life". Also of great importance is the psychology of the "country's wealth" inherited from the USSR and the "habit of centralized energy supply". Despite the fact that approaches to AES have changed in the world, "there are still lots of people in our country – ranging from top bosses to ordinary people, who think of alternative energy as having no future" and everybody knows about the corruption in the energy sector and do not believe that it can be changed.

Given that such people are in different positions in society, including decision-making, overcoming this barrier is especially significant. The importance of the psychological barrier in some experts' opinion is second only to the economic one, because "it could cause all the highly advanced energy programmes to crash".

Information barriers
- poor awareness of all social groups (leaders, population, general public) about AES opportunities
- lack of wide propagation of AES in the mass media
- insufficient information on best practices of using AES, scarcity of marketing and scientific-technical information about equipment (manufacturers, technical specifications, suppliers and prices) and of special publications and brochures on AES.

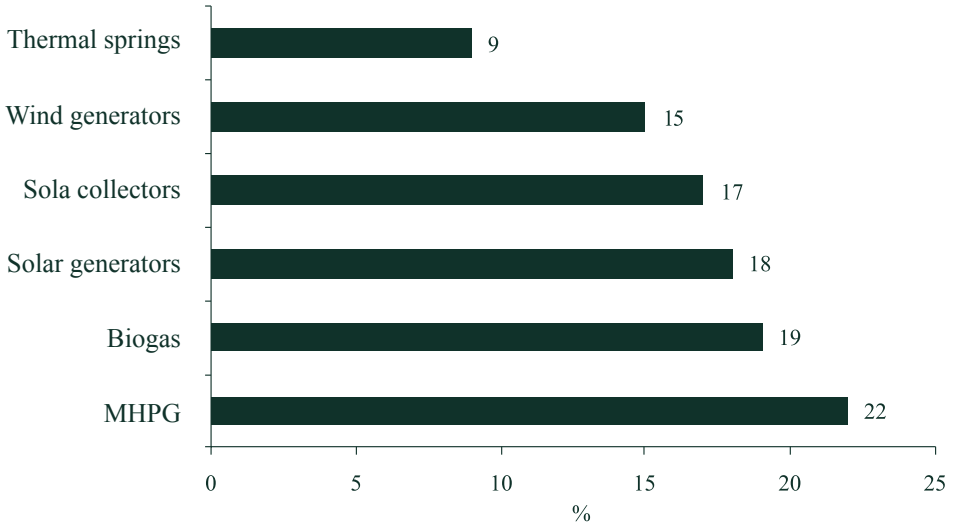
The research showed that most respondents (56%) had heard nothing about non-traditional ways of getting energy.

Diagram 5.1. Awareness of AES



Most of the population is aware of MHS and biogas units – they were mentioned by 20% of all who are aware (Diagram 5.2).

Diagram 5.2. Awareness of the population of types of AES



Analysis has revealed that the awareness level of AES was higher in higher income households (60%) and among men (53%), which is primarily due to this social group having greater access to information and background knowledge of technical information. Similarly, respondents with higher levels of education (66%) are more informed about AES than respondents with lower levels of education (29%).

Today it is far cheaper for people to use electricity. The problem is hard to solve unless people don't understand that there are cheaper ways of getting energy for at least cooking and heating water

Expert, Bishkek

Research indicated that the majority of the population (70%) needs additional information about AES, thus the preferred channels of information sources were defined as:

- mass media - 43%
- ayil okmotu/rayon administrations – 16%
- friends - 16%
- electricity industry workers – 10%
- NGOs – 9%
- consumers and sellers of AES – 6%

Annex 1. Rate of power consumption[3]

Table 1. Rate of power consumption for household use

	Annual consumption per capita, kilowatt/hour
Lighting	122
Cultural and domestic appliances	43
Economy-based appliances	56
Low-power heating devices	18
Partial cooking of food	15-20
Cooking	up to 45
Hot water supply by open-pipe heater	1
Heating	5-17
Working on private farms	15-25

Table 2. Rates of energy consumption for cultural-domestic services

	Annual expenditure per capita, kilowatt/hour
Annual electricity consumption per capita	120-170
Including:	
Lighting in municipal buildings, streets and squares	50
Electrical appliances in municipal buildings	36
Heating and ventilation	16-26

Annex 2. Characteristics of the focus areas

Ysyk-Ata resort, Isyk-Ata rayon, Chui Province
Yssyk-Ata resort with a population of about 500, 45% of whom are men and 55% - women is located 1,700 metres above sea level, along a mountain river and is the last settlement in a canyon. There are 4 multi-storey buildings with 106 flats and 1 dormitory with 24 rooms. All of them are government-owned flats that have not been privatized. There is a school with 90 pupils but there is no kindergarten. Radios and mobile phones don't work because of the high mountains but there is television and an irregular telephone network.

60% of the able-bodied population and most of the pensioners work or used to work at the resort. Everybody rents out their flats to the people arriving for treatment, which is a big part of family budgets. Some people have cows, sheep and hens and garden, mainly for private consumption. The settlement is all-electric supplied by the national grid and according to residents there are very few power cuts and these are mainly due to accidents. Almost everybody cooks on electric ovens, but some use gas ovens.

Heating and hot water supplies for the resort come from thermal springs and the supply system was set up from the day construction of the resort began, but later on, due to high water mineralization the heating system fell into disrepair and in the mid 1990's the houses were heated by an oil-fired boiler. It was decided to reconvert to the thermal supplies due to the boiler breaking down and the high cost of fuel-oil. At present there are problems with the state of the heating pipes and their insulation and there are sections, which have no heat insulation at all and as a result the temperature in the flats in the

[3] Rural Electrician's Handbook Ganelin A.M., Kostruba S.I. M.: Agropromizdat, 1988., 304 p

heating season remains below 16-17 ° C and even lower in freezing weather, therefore many residents use heaters and homemade electric appliances to warm their flats. This is because the temperature of the thermal water at the inlet is 54° C but when it reaches the consumers the temperature has fallen to 35-38° C. It was noted that the flats are poorly heat insulated and according to respondents only a few of them line their windows in winter with special materials. The houses are old and most windows and doors are in need of repair.

Apart from three small cafes there are no other private business entities in the village and all the cafes use thermal water and electricity for water, heating and lighting.

The resort management is actively interested in AES, a special interest being in MHS as other sources are not profitable for them to use – the sun does not stay over the narrow pass for long and in addition this is an area of high clouds; there is not enough wind to generate energy and the number of livestock is too small to make biogas.

The vast majority of the people is unaware of AES and is not interested in environmental problems and see their life only in relation to working at the resort.

Poltavka village, Jayil rayon, Chui Province
The village is 65 km to the west of the capital city, is multinational with 1,013 households and 3,776 inhabitants, the average size family is 4 and 30% live below the poverty line.

Their main occupation is livestock breeding and farming. In 2006 there were 1,166 cows, 236 horses, 1,756 sheep, 566 pigs and 9,830 head of poultry.

There are a school, kindergarten, dairy, dairy farm, 2 mills, a sausage making shop, club, library, café, tailor's workshop, barbershop, hospital, post office, automatic telephone exchange, 5 shops, 2 bakeries and a pharmacy.

All the houses use centrally-supplied electricity and there are no AES in the village. Ten years ago there was a mini power station here but now it is in disrepair and has been looted. Power cuts happen very often – several times a week, for 2-3 hours and sometimes for days. The voltage in winter is very low and electric appliances and lights hardly work. During the survey people mentioned burned out electric appliances due to sudden power cuts but no one had ever complained to anybody. The inhabitants use electricity for household needs and for lighting and heating (during the lambing season) of livestock buildings.

The village authorities think that it would be a good idea to install a wind generator, which would reduce the load on the central electricity grid.

People in the village are economically active and about 200 people commute to Kara-Balta to work and according to the experts this village has great potential for installing biogas units.

Kaindy village, Naryn rayon, Naryn Province
The village is located in a Nature Reserve and the population is mono-ethnic - only Kyrgyz. There are 110 households, a private bath house, school, post office and medical station. The population is mainly engaged in cattle breeding and they also grow wheat but very often it doesn't have time to ripen. Villagers cultivate the land manually as there is no motorized equipment. Each household has one horse and 5-6 cows. The primary income sources are pensions and allowances from the state.

The entire population uses electricity from the central grid - there is no other AES but there are shortages

of electricity in winter when the voltage is often very low. Due to strong winds there are frequent power cuts and almost year round villagers use dried animal dung or wood for cooking and heating and in winter they use homemade electric stoves and heaters. The village authorities have attended workshops on AES and in the near future it is planned to install a biogas unit here, with the help of sponsors. Installation will cost 125 thousand soms and support is being provided by UNDP.

Darkan village, Jety-Oguz rayon, Issyk-Kul Province
The village is on the southern shore of the lake, 400 km from the capital city and since 2006 has been categorized as a mountainous area. The population of 6,169 is totally Kyrgyz and the average family size is 5. The village has 2 schools, a workshop, 2 mills (water and electric), grinding mill, timber mill, 2 tailors shops, a library, a veterinary practice, a telephone and post office, a bath house (closed in winter), a woodworking shop and 18 shops and kiosks.

In 2006 there were 1,412 cows, 1,586 horses, 13,884 sheep, 1,236 goats and 5,578 head of poultry. The main occupation of the population is livestock breeding (60%) and farming (40%). The villagers grow wheat, potatoes, barley, lucerne, currants, apples and pears for sale.
Everybody uses the central grid and in the hot season many people cook on fires and heat samovars. Power cuts are frequent and sometimes last for days. At the time of the survey, there had been no electricity for two days. Because of overloading, the transformers and transmission lines are often burnt out. Some people have heard of AES as there is a MHS in the neighbouring village of Saru, a wind turbine in Jenish village and biogas units in Pokrovka and Saruu. The authorities and businessmen of the village are interested in installing biogas units, AES and solar panels, however many ordinary people don't trust AES.

Nylda village, Manas rayon, Talas Province
The village is located 20 км from the oblast centre and is close to a forest. The population is mainly Kyrgyz and Kazakhs. The village has 263 cattle, 2,111 sheep and 68 horses. In recent years there has been an increase in the numbers of livestock.

There are a midwife/medical surgery, a clubhouse, school, mill and a timber mill, grinding shop, welding shop, oil mill and 4 trade outlets all of which, apart from the school and midwife/medical surgery, are not heated in winter. A river, which the villagers have divided into three canals to use to irrigate their farms, runs through the village and as there is no source of drinking water, people drink water from the canals.

The population is engaged in livestock breeding and growing kidney beans, which is most profitable for them and wheat, maize and sunflowers.

All residents use electricity from the national grid and in winter the voltage is very low and there are power cuts because of accidents and frequent strong winds, which can last up to 2-3 days. No AES have been found in the village.

However, in 2002 thanks to the support of international organizations and a person named S. Raimkulov, a biogas unit costing 10 thousand soms was installed in the village and some villagers helped install it. There was a special workshop on biogas and an opening ceremony was held at which a pot was boiled as a demonstration, but shortly after the guests left, a pipe was damaged (a car ran into it) and it broke down. Currently the unit is not working and people are afraid to fix it as it has gas inside it and according to the contract they can't take it apart. According to residents, the unit is incomplete and requires modification and so many villagers would like to use other biogas units.

Arkit village, Ak-Suu rayon, Jalalabad Province
The village is situated in the Sary-Chelek Reserve, with a population of 1,112 people, who live in 240 households. The village is almost mono-ethnic, with only 8 Russian nationals. In Soviet times, it was a National Reserve and so famous scientists lived and worked here for a long time, therefore, today despite its remoteness, the population here is more advanced and active and the level of education is quite high and many speak Russian. The inhabitants use river water for cooking and drinking. There are 514 head of cattle, 67 horses and 416 sheep in the village and there are limits on the types and numbers of cattle and domestic pets, e.g. goats and dogs are not allowed.

The main employers are the reserve, school and post office but most citizens are unemployed and mainly keep livestock for subsistence and use forest products (plums, apples, raspberries and nuts). Many men go fishing and hunting. Everybody uses the national grid although there is a MHS, installed by a GEF project. The population didn't participate in building this station. The hotel situated in the reserve is fed from the station. The problem is that the actual output is several times lower than its rated power. It is necessary to convert to AES since the village is putting pressure on the reserve and practically no other type of fuel except firewood, is used.

Myrza-Ake village, Uzgen rayon, Osh Province
This is a large village of 3,332 households and 17,653 inhabitants located at the foot of some mountains. It is mainly mono-national and there are not many other nationalities here and the poverty level is 14 - 15%.

Number of livestock - 2,416, horses -595, sheep - 4,000, goats - 886, poultry - 9,352. There has been no real trend to develop livestock breeding.

There are: 7 electric mills (not all of them work), 1smithy, 1 grain mill (not working), 1 filling station, 1 seed farm, 6 oil mills, 2 midwife/medical surgeries, 4 pharmacies, 1 hospital, 1 culture club, 2 libraries and 1 bath house. Almost all the village has access to clean drinking water except the area of Adyr where water is not supplied due to a breakdown.

The main occupations are agriculture and cattle breeding and many people are unemployed. Everything is electric and supplied by the national grid. The village has huge electricity supply problems and there are power cuts almost every day and the voltage is low in winter. No alternative energy sources have been found in the village.

ALTERNATIVE ENERGY
Market Research

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INTRODUCTION

This survey is needed because of the absence of reliable data on producing AES equipment at national level. The AES equipment market is currently moribund due to the lack of demand for its products and is explained both by the low purchasing power of the population and the lack of information on AES. Producers of AES don't pay much attention to promoting their products in the market as manufacturing AES equipment is not their main field of activity and there are no dominant brands of equipment either. Currently, AES equipment is ranked among those goods that are not in great demand and its producers don't face strong competition and are not involved in rendering services.

In recent years, due to the efforts of international projects and foreign investors, there has been a slight growth in the production of biogas units and MHS (mini hydroelectricity station) and many private businessmen have installed MHS and biogas units, which prove there is a potential market.

At the same time, studies of purchasing behaviour have shown that potential buyers have an extremely low awareness of AES brand names, producers and prices. Economic benefits from using AES also remain unknown to a large part of the survey participants. The study has also revealed the correlation between the willingness of people to use AES and their awareness of them. Indicators of priority and general knowledge are almost zero and the main criterion for people choosing a product is its price.

Government institutions are involved in promoting AES only at the stage of issuing licenses. There are no clear cut requirements on the certification and installation of AES, which creates the basis for corruption.

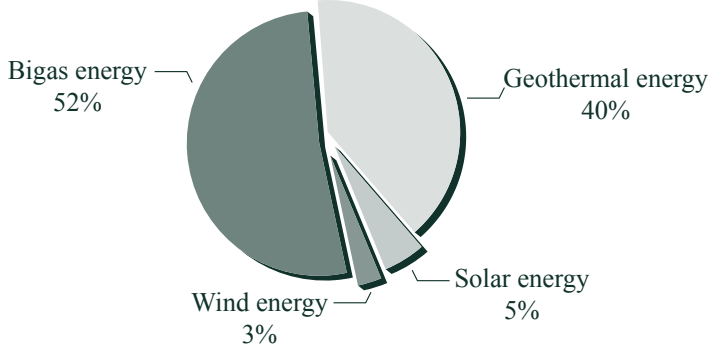
The most promising AES for rural communities is biomass energy, small streams and solar energy. AES need government support and the development of comprehensive area plans for the combined use of AES and the electricity grid.

1. AES MARKET VOLUME AND DYNAMICS

The study has shown that there is no true official information at national level on the volume of AES equipment produced. There are several reasons for that: firstly, all enterprises producing AES equipment are private therefore insufficient attention is paid to the statistical accountability of output; secondly, as customers are often private persons, the necessary documentation is not completed or by the provisions of agreements is confidential. Thus, for example, producers themselves cannot give true data on how many MHS have been produced by them in a given period. Estimated information was provided to surveyors mostly by guesswork, which is why information on the volume of AES output is so vague.

Production volumes of AES are shown in Diagram 1.1., which is based on a generalized expert assessment.

Diagram1.1. Expert assessment of the AES market volume



Thus it can be concluded that the AES market today is largely represented by biogas units and MHS. There are relatively few products using solar energy – solar panels and solar energy generators and practically no equipment using wind and geothermal energy sources.

On the whole experts consider that the AES equipment market is currently moribund, which is basically explained by the lack of demand for them. The reasons for this low demand are the existence of barriers to developing the AES market, which were mentioned in the household survey. Low purchasing power can be seen year round.

Biomass energy equipment

According to official data a total of 50 biogas units of different models have so far been installed in the republic, but official estimates put the actual number from 80 to 100. The difference is due to users making their own and imported systems .

Table 1.1. Data on the number of installed biogas units

Biogas Unit Type	Installed	Inoperative	Working	Operated only in summer	In working condition but not used
Units without heating and isolation and with a hand mixing system	30	21		9	
Units with heating and isolation and with a hand mixing system	5		5		
Units both with heating and reactor isolation and a pneumatic mixing system	12		7		5
Units with heating, reactor isolation and a hydraulic mixing system	3	3			
Total	**50**	**24**	**12**	**9**	**5**

In most cases the capacity of units with and without heating and isolation with hand mixing systems is from 4-5 to 12 cubic metres; units with heating, reactor isolation and a pneumatic mixing system -8-10 cubic metres and units with heating, reactor isolation and a hydraulic mixing system – from 20 to 250 cubic metres.

Half of the installed units, i.e. 24, are currently inoperable and require modification or repair. Only 12 of them work all year round and 9 only in summer. Table 1 shows that most of the inoperative units are those without heating and isolation with a hand mixing system – only 9 out of the 30 installed are working and the others need repair or modification.

So it can be concluded that half the simple biogas units costing from 5 to 22 thousand soms don't work after installation so it would be advisable to install modern, year-round working units at prices ranging from 45 to 300 thousand soms (1 USD = 35 soms).

A survey of people who would like to install biogas units found that in most cases villagers are inadequately informed about the types of units and their technical characteristics and are totally unaware of producers and prices. Analysis of the purchase of biogas units showed that nowhere do respondents consider the

features of products, such as efficiency, guarantee period, producer, appearance, terms of delivery and installation, etc. and the main criteria for potential buyers of biogas units is the price. The survey shows that no complaints are made to suppliers by buyers of those units that failed to work.

According to experts the average consumer price of biogas units has increased during the last 5-7 years, due mainly to a lack of components and significantly more expensive metal. Producers usually buy the components in city markets at retail prices and less frequently in specialized shops, which is reflected in the total price of the equipment.

Small water flow energy equipment

The study found a lack of accurate data on how many MHS have been produced and installed and this information is available only from individual enterprises, which manufacture and install MHS.

A survey of MHS producers showed that each plant is "unique as it is specially designed taking into account local requirements and natural conditions". Therefore the price is often set by the cost of ground and preliminary works and turbine capacity. If an MHS is produced by an international project then the components as a rule are imported from abroad, whereas for private orders from local businessmen MHS components are obtained in city markets and are mainly old or used (second hand) parts from Soviet Hydroelectric Stations or are Russian or Chinese made. As for the producers in the republic, they produce assemble, install and commission hydro turbines up to 100kWt/h capacity.

Our equipment would be cheaper if components were produced here, for example at the Lenin or Kadji-Say factories
Expert, Bishkek

The MHS components market has several different producers: Atommash Ukraine (hydro-turbines), Inset Leningrad (hydro-turbines, generators), Tyajelectromash Sverdlov and others. The main problem is that many foreign manufacturers produce turbines with capacities of more than 10kWt/h while less powerful turbines are more in demand in the country's market, thus demand for turbines with capacities less than 10kWt/h is not met.

According to the study, the main criteria for a user in buying a MHS are price and capacity. Prices for MHS fluctuate depending on their capacity, from approximately 600-700 USD per 1 kWt/h of energy.

Solar powered equipment

The study shows there is a lack of solar powered equipment in the market. Most solar energy is used for primitive units such as self-heating solar showers and people also heat water in their pools and tanks.

Survey participants possess almost no information on how to get electricity from solar energy and solar pumps and see solar energy only in terms of heating water.

Respondents don't know about the types and quality of equipment and manufacturers. Scanning consumer behaviour revealed that the main criterion for purchasers is price; in rare cases such criteria may be the country-producer but as a rule not in an explicit form – "Chinese made is undesirable" and are not purchased. The price of solar panels is about 6,000 USD per kWt/h capacity.

According to the survey, ready made equipment for solar energy use is neither imported nor manufactured in the country. Russian, Ukrainian and Chinese made parts are most common. On the whole, the import structure of solar powered equipment remains unknown and our attempts to obtain true data have been unsuccessful.

2. AES PROMOTERS

According to survey participants the main AES promoters are:

- Players in the AES market (manufacturers, sellers)
- Equipment designers and developers
- Construction organizations
- AES users
- State organizations issuing licensing documents
- International organizations and foreign investors.

Alternative energy gets no government support and is overcoming all its difficulties and thrusting ahead largely with the help of enthusiasts and private investors

Expert, Bishkek

AES equipment producers

The study found a lack of information in the country about certain AES manufacturers and available data are fragmentary, therefore expert assessments are widely used.

Experts estimate there are few organizations manufacturing AES equipment. There are about ten organizations assembling biogas units, not more than 2 or 3 MHS and no more than two solar powered equipment suppliers.

As a rule, manufacturers develop, install and commission the equipment and subsequently provide technical maintenance and repair back up services. Almost all the supplied equipment is uncertified.

According to data provided by manufacturers, AES equipment is very rarely ordered and therefore such products are usually subsidiary rather than primary activities for manufacturing companies. According to experts' assessments this tendency negatively affects promoting AES as "producers today, in essence, are not interested in using new AES manufacturing technology nor do they engage in scientific research, which ultimately affect the efficiency of the equipment".

Unstable demand has led to all components being obtained by manufacturers in city markets from private traders and rarely from specialized shops and in manufacturers' opinions, this is undesirable because on the one hand "there is no guarantee –you buy second hand and don't know how long it will work" and on the other hand you buy at retail prices rather than manufacturers' prices.

Our manufacturers are now in the situation that they take all orders, including equipment for AES. They assemble machinery from whatever they find – from old dismantled units or buy from junk-dealers and their overall task is to tailor the available parts to their needs, therefore the quality and appearance don't meet modern standards. For example, pressure sensors of biogas units look old and frightening and a substantial client is not likely to like our equipment because it is made from old parts.

Expert, Bishkek

Russia is creating so called silicon valleys and the closest to us will be Tomsk. We could arrange supplies of components (second grade) from Russia and start assembling solar panels. It would be much cheaper than buying batteries from the European part of Russia or China.

Expert, Bishkek

A big stimulus for AES manufacturers has been international projects that have placed several orders however these orders are not regular and generally cannot "pep up the market".

AES and components' sellers
Dealers in AES components mainly work in big oblast level markets and in the capital city most dealers sell in two markets – Alamedin Bazaar and Kudaybergen Automarket. They are mainly private traders and less frequently specialized shops (car body shops, metal plants, etc.).

Goods are bought from small suppliers and private persons. The range of spare parts come from former plants, new home made models, new and second hand parts made in Russia and new parts made in China and there are new and used turbines, steel sheets, bearings, etc.

Developers and designers of AES equipment
Developers and designers of AES equipment are highly qualified specialists with wide practical experience of designing and installing equipment during Soviet times. Currently, these specialists are involved in project-technical work on executing orders for AES equipment. Due to the low demand for AES equipment, designers and developers are contracted only for the duration of a particular project.

The study showed a rather limited number of designers and developers of AES in the country. For example, only two-three names in biogas unit development were mentioned by experts and only one in the sphere of MHS.

AES equipment users
According to the study, AES users are different entities including state organizations, farming enterprises and businessmen and the general public.

State organizations are largely MHS energy users – for example the Sary-Chelek State Reserve. Three MHS have been installed at the Chichkan Pass of Jalal-Abad oblast, where the users are mainly the owners of a private café and houses. The users of biogas units are mainly farming enterprises and rural businessmen and owners of bath-houses, for example. The users of solar energy are both private individuals and businesses. Geothermal energy is used in resorts –sanatoria and hotels and by the people and businessmen living near the source.

Construction organizations
Building companies carry out a range of works for installing equipment, such as building bypass channels, concreting and erecting sheds, etc, usually on a sub-contract basis with manufacturers and are liable for their work and they have the necessary equipment and expertise to perform this kind of work. Building AES is not their main source of income because such orders are rare and irregular.

State licensing organizations
The study has shown that state bodies promote AES by issuing licensing documents for the installation of MHS (biogas and solar powered equipment doesn't require a license).

I get the impression that the state not only gives no support but deliberately erects barriers to developing non-conventional renewable energy. Moreover I think that big energy wants to remain a monopolist, as it benefits its leadership and the anti-monopoly committee turns a blind eye to it all.

Expert, Bishkek

According to information from private MHS owners, to install their stations they had to get licenses from Ayil okmotu (local community governance bodies), the Department of Water Economy, Environmental Management, State Property Register, power distribution stations and various community organizations. On average registration of documents takes up to 6-8 weeks of continual visits and waiting around in various organizations and bodies. In respondents' own words, "without relatives or influential connections it is almost impossible to get a license".

International organizations and foreign investors
About half of the biogas units built in the republic have been partly financed by GEF/UNDP and the others have been built by the World Bank, ARIS, JICA, GTZ, EBRD and others.

According to experts, the most attractive foreign investments are MHS. The republic has experience of working with an investor at Kalinin HPS in 1998, Mekamidi a French company, however, it will not continue investing in small-scale power generation due to the Kyrgyz party owing the investor 1,235,145 soms. Therefore, to attract more and new investments in the market, the conditions (legislative base) should be created that ensures execution of the law by all energy sector entities.

3. POTENTIAL FOR DEVELOPING ALTERNATIVE ENERGY IN SELECTED COMMUNITIES

The potential for developing alternative energy can be seen in the need to satisfy the population's energy needs, which are not met and what the reasons for that were. It is important to note that this approach is based on the subjective judgment of respondents, which is influenced by the level of their aspirations, long-standing habits and lack of higher demands because "everybody lives like this". Despite this, we believe that the judgments given by villagers can be used as information

Table 3.1. Information about respondents, who are totally dissatisfied with energy supplies in autumn-winter (%)

Village	Hot water	Heating	Cooking	lighting	Domestic appliances
Yssyk-Ata	0	0	0	0	0
Poltavka	7	7	4	4	11
Kainda	25	4	4	4	14
Darkan	7	4	11	25	30
Nylda	4	4	4	4	0
Myrza –Ake	61	57	50	57	64
Arkit	36	18	4	43	14
Katran	7	0	0	61	43
Total	**32**	**16**	**11**	**19**	**23**

Table 3.2. Information about respondents who are totally dissatisfied with energy supplies in spring-summer (%)

Village	Hot water	Heating	Cooking	lighting	Domestic appliances
Yssyk-Ata	0	0	0	0	0
Poltavka	7	7	4	4	11
Kainda	7	0	0	0	4
Darkan	11	7	11	43	33
Nylda	0	0	0	4	0
Myrza –Ake	54	61	57	68	71
Arkit	36	25	7	29	14
Katran	4	0	0	29	14
Total	**28**	**15**	**10**	**15**	**16**

The data show that the villages that are most dissatisfied with energy supplies almost all year round are Myrza-Ake, Arkit, Darkan and Katran. Different villages show different degrees of needs for hot water, heating, lighting and domestic needs. The most extreme indicators are marked in grey, but on the whole most energy is needed in autumn-winter period and the biggest shortages of energy are for water heating and domestic needs.

Yssyk-Ata is the only surveyed location where nobody is totally dissatisfied with energy supplies. The main reason for this is that geothermal energy and electricity are used there, but even there 48% of respondents are quite dissatisfied with energy supplies all year round. Note that the number of "totally dissatisfied" and "rather dissatisfied" in other villages is 80-90%.

The population is also dissatisfied with the quality of the existing energy supplies, thus, for example, constant power cuts, voltage fluctuations and tariff increases cause discontent amongst almost all villagers.

Table 3.3. Reasons for dissatisfaction with energy supplies (%)

	Regular power cuts	Voltage fluctuations	Tariff increases
Yssyk-Ata	0	0	100
Poltavka	100	100	100
Kainda	100	100	100
Darkan	100	85	79
Nylda	100	100	96
Myrza-Ake	100	100	96
Arkit	100	100	100
Katran	100	100	100

Table 3.4. Number of respondents wishing to use AES (%)

Community	People wishing to use AES
Yssyk-Ata	29
Poltavka	15
Kaindy	57
Darkan	86
Nylda	54
Myrza-Ake	25
Arkit	71
Katran	4
TOTAL	**47**

Two villages (Darkan and Arkit) stand out whose population would like to convert to alternative kinds of energy.

In terms of other villages it can be stated that despite the dissatisfaction of people with the existing energy supplies they are wary of innovations mainly due to the lack of information. There is a direct dependence between the number of people wishing to use AES and the population's awareness of AES.

Table 3.5. Awareness of residents of surveyed communities of AES (%)

	Aware	Unaware
Yssyk-Ata	39	61
Poltavka	7	93
Kaindy	57	43
Darkan	82	18
Nylda	43	57
Myrza-Ake	11	89
Arkit	71	29
Katran	4	96

The willingness to use and great awareness of AES in Darkan, Arkit and Kaindy is explained by the fact that they have already installed a MHS and the population can see and knows the advantages of these innovations.

Table 3.6. The number of respondents wishing to use AES in households for light (%)

	Electricity from a centralized transmission line	Solar energy	Geothermal energy	Wind energy
Issyk-Ata	88	38	0	0
Poltavka	94	6	0	0
Kaindy	50	44	6	13
Darkan	67	25	0	8
Nylda	40	53	0	7
Myrza-Ake	14	86	0	0
Arkit	85	15	0	0
Katran	20	10	0	0
Total	**54**	**40**	**5**	**12**

Table 3.7. Number of respondents wishing to use AES in households for heating water (%)

	Electricity (from centralized transmission lines)	Biogas	Solar energy	Geothermal energy	Wind energy
Issyk-Ata	63	13	11	0	13
Poltavka	60	10	8	0	0
Kaindy	13	56	25	6	0
Darkan	33	50	8	4	8
Nylda	27	53	20	0	0
Myrza-Ake	35	5	43	17	0
Arkit	20	20	10	0	50
Katran	20	10	0	0	70
Total	**26**	**31**	**30**	**9**	**17**

Table 3.8. Number of respondents wishing to use AES in households for heating (%)

	Electricity (from centralized transmission lines)	Biogas	Solar energy	Geothermal energy	Wind energy
Issyk-Ata	63	0	38	0	0
Poltavka	60	0	0	0	0
Kaindy	50	31	25	6	0
Darkan	42	53	6	0	0
Nylda	20	80	0	0	0
Myrza-Ake	71	14	14	0	0
Arkit	60	30	10	0	0
Katran	20	0	0	0	80
Total	**37**	**38**	**21**	**6**	**10**

Table 3.9. Number of respondents wishing to use AES in households for cooking (%)

	Electricity (from centralized transmission lines)	Biogas	Solar energy	Geothermal energy	Wind energy
Issyk-Ata	88	0	25	0	0
Poltavka	92	10	5	0	0
Kaindy	80	6	10	0	0
Darkan	46	67	0	0	4
Nylda	27	67	7	0	0
Myrza-Ake	95	0	0	0	0
Arkit	25	55	0	10	10
Katran	97	0	0	0	0
Total	**49**	**40**	**15**	**2**	**5**

When the question was asked as, “Do you personally wish to install AES in your house?”, the number of those wishing to do so significantly decreased, with the exception of three villages (DArkan, Nylda, Arkit) in which the number of people who wish to install biogas units and solar heater is highest and ranges between 57% and 79%.

Table 3.9. Preference of respondents for kinds of AES

	MHS	Biogas units	Solar heaters	Solar power stations	Wind power stations	Geother-mal energy
Issyk-Ata	54	11	14	21	4	0
Poltavka	0	5	7	5	0	0
Kainda	4	0	4	4	0	0
Darkan	32	61	36	11	21	7
Nylda	21	79	32	14	0	14
Myrza-Ake	0	21	14	7	0	4
Arkit	43	57	57	46	39	36
Katran	18	0	4	4	4	

The question about how much a household is ready to spend on buying proved difficult for many to answer and most of them declined to answer.

Table 3.10. Average amount of money households are ready to spend on buying AES (som)

	MHS	Biogas units	Solar heaters	Solar power stations	Wind power stations	Geo-thermal sources	Other energy convert-ers
Issyk-Ata							
Poltavka	929	700	678	700	750	0	0
Kainda	589	2000	1000	1000	0	0	2000
Darkan	2912	3220	1700	233	1328	99	99
Nylda	4000	2523	2167	2000	0	0	0
Myrza-Ake							
Arkit	350	2350	0	4000	0	0	2000
Katran	150	0	200	200	200	0	0

Nevertheless the authors have attempted to give the average amount indicated by respondents. Today people are willing to invest from 233 to 4000 soms into developing AES depending on the village.

Despite the great wariness of the population towards AES in the surveyed communities there is great potential for developing alternative energy, especially promoting energy from biogas units, but it is necessary to take into account the ways animals are kept. During the study it was revealed that many households especially in Issyk-Ata keep their livestock on pastures all year round.

According to respondents' evaluations the numbers of livestock including cows, sheep and horses are increasing particularly in Kainda, Katran, DArkan and Nylda.

Table 3.11. Number of respondents who plan to increase livestock numbers in the next 5 years

	KPC	Cattle	Sheep and goats	Horses	Yaks	Pigs	Birds
Issyk-Ata	39	32	7	0	0	0	0
Poltavka	4	7	0	0	0	7	0
Kainda	89	95	80	92	7	0	64
Darkan	75	89	93	89	7	4	89
Nylda	68	79	61	39	0	0	79
Myrza-Ake	11	7	4	0	0	0	7
Arkit	89	89	82	18	0	0	57
Katran	85	90	82	46	0	0	46


UNITED NATIONS DEVELOPMENT PROGRAMME
"ENVIRONMENT PROTECTION FOR SUSTAINABLE DEVELOPMENT" PROGRAMME
ПРОГРАММА РАЗВИТИЯ ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ
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UNDP
Kyrgyzstan
Кыргызстан
ЗАО „ИНКРАФТ"
ЗАО „ИНКРАФТ"

SUUSAMYR VALLEY
HOUSEHOLD SURVEY

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INTRODUCTION

The purpose of this survey is to provide information on the social and economic status of families living in the Suusamyr Valley, their dependence on livestock farming and their expected reaction to the introduction of a new pasture regime, due to revitalising and developing livestock farming, pasture rotation and partial re-orientation on yak and camel farming and other alternative income sources. One of the most important of the survey's functions was to enable researchers to discuss the Demonstrating Sustainable Mountain Pasture Management in the Suusamyr Valley[1] Project document.

The Suusamyr Valley is located in the Jayil rayon of Chui province. The Suusamyr Ayil Okmotu (AO) covers six villages: Suusamyr, Kaisar, Tynyk, Pervoye Mayia, Kojomkul, Karakol and Kyzyl-Oy. According to the AO the total number of households is 1,354 homesteads, the population is 6,418 people, of whom 3,162 are 18 or over. The AO residents are homogenous – 99.9% are Kyrgyz and there are only two Russian families. There are five schools in the AO that teach 1,473 children, one hospital, one ambulance station and four medical obstetrician stations, two clubs, four libraries and three bathhouses. All social and cultural facilities require major repairs. There are 56 trade outlets, a livestock market and five mini-mills. The poverty level according to the Ministry of Labour and Social Protection of the KR is 18.5%, which is higher than the rayon average (16.1%).

Three communities are taking part in the ADB clean water access project in the AO.

The region specialized in livestock farming in the Soviet era and farmed sheep, goats and cattle. It has retained its large farms and winter livestock barns.

1. METHODOLOGY

The research covered the views of different layers of society ranging from ordinary households and chabans (shepherds) to representatives of government structures, researchers and international organizations.

The developed methodology made it possible to consider and compare quantitative and qualitative methods of information gathering.

The quantitative method covered representative information on the social and economic state of households in the studied villages, their relation to new initiatives for managing remote and near-ravine pastures etc.

The qualitative study involved in-depth interviews with stakeholders and in the selected villages. The basis for choosing respondents were criteria such as: - excellent awareness of the work of the community, participation in its activities, an analytical way of thinking, age, ethnic, gender and professional differences.

[1] In November 2007 the GEF granted funds to implement the Demonstrating Sustainable Mountain Pasture Management in the Suusamyr Valley Project

The target groups of this research consisted of:

- Experts – 40
- Residents – 900
- Livestock farmers – 15
- Owners of roadside cafes – 15
- Roadside vendors - 30
- Truckers - 20
- Private carriers (taxi drivers) - 30

A special section was devoted to gathering analytical reports on stakeholders, for which in addition to in-depth interviews, analytical information was gathered.

Sampling

The quantitative method covered villages of the Suusamyr AO and the data on the number of respondents is shown in Table 1.1. below. Layered equally weighted sampling was used to select a total of 900 respondents over 18 and overall the opinions of 1,050 people were gathered.

Table 1.1. Number of respondents

Survey area	Number of Households
Suusamyr	382
Kaisar	49
Tounyk	90
Pervoe Maya	93
Kojomkyl	137
Karakol	22
Kyzyl-Oi	127
Total	**900**

Picture 1.1. Location of the Surveyed Villages

Бишкек-Суусамыр - 140 км

Tools
3 tool kits were developed for gathering information: for local residents, communities and stakeholders. Each questionnaire had its own specifics and consisted of sections related to the activities of residents, communities and stakeholders.

Database and Analysis
A database was set up using Blaise – a special language that needed logical and arithmetic supervision.
- The quantitative analysis used SPSS with obligatory calculations of frequencies, cross tabulations and significance tests
- The quantitative analysis was translated from Kyrgyz and analysed information collected from stakeholders.

2. CHARACTERISTICS OF RESPONDENTS

Trade and Public Catering on the Bishkek – Osh Highway
The existing socio-economic situation in the Kyrgyz Republic, abrupt decline in agricultural output, failure of former large-scale collective farms that existed in the form of kolkhozes and sovkhozes and widespread unemployment have become especially acute for such a remote rural area as the Suusamyr Valley.

Since all freight traffic and transport between the north and south of the country has switched to the Bishkek-Osh highway, it has become the main source of living for adjacent villages.

Spontaneous trade and public catering sites have emerged along the highway, aimed only at servicing passers-by.

Mainly, these cafes are based not in specially designed buildings but in railway wagons or in flimsy constructions that are quite modestly furnished and equipped.

The study showed that in most cases, the owners of these sites are registered as private enterprisers and have patents (fixed payment licenses) to trade for a limited period (up to one year), with no exact specification of location, which enables them to move around.

In general they are residents of adjacent villages. For heating and cooking they use metered electricity taken from the grid, firewood, pressed dung and gas.

The water for drinking and cooking is taken from rivers, as there are no artesian wells. The livestock for meat (mainly sheep) are grazed along the highway, as are brood mares, whose milk and kymyz are offered to people who stop at the roadside facilities. The study revealed that permanent grazing of livestock in the same area has led to severe damage to roadside pastures.

Early vegetables are brought in from Chui province by drivers.

In general, the range of produce on sale is quite limited - various cheeses, muy (butter) kaimak (sour cream), kymyz (fermented mare's milk), most of which are homemade by the vendors themselves or their neighbours.

It appears that there is no organised waste disposal system along the highway and as a result, the areas around the cafes are contaminated; organic food and household waste is thrown into rivers or waste tips near the cafes. When asked what they would do when there would be no more room to pile up their waste,

the entrepreneurs said, “I will move my wagon a bit further along”. We got the impression that it is this category of respondents who make the most sizable negative impact on the region’s environment.

The great dependence on the numbers of passing visitors makes the owners of trading spots work closely with passing drivers – truck drivers (regular clients for food – pasta, alcoholic drinks, tea, sugar , etc.) and coach drivers (bringing in clients).

Roadside trading spots and cafes have to pay frequent bribes to controlling bodies - tax inspectors, police, electricity officials at various levels (mostly area and local level) - in the form of free meals.

Residents of the Suusamyr Valley involved in trade and catering along the Bishkek-Osh road have quite high incomes – on average 40% higher than the average farmer.

Drivers on the Bishkek-Osh road

The survey showed that a permanent group of drivers is operating who have been working on this highway for a long time. Most of them are residents of Osh and Jalal-Abad provinces and depending on the type of transport, are grouped into long-range (truck), van and private passenger vehicle drivers.

Drivers who have been working more or less regularly have established close contacts with the roadside traders, which produces mutually beneficial cooperation whereby roadside cafes get clients and the traders and drivers get free meals.

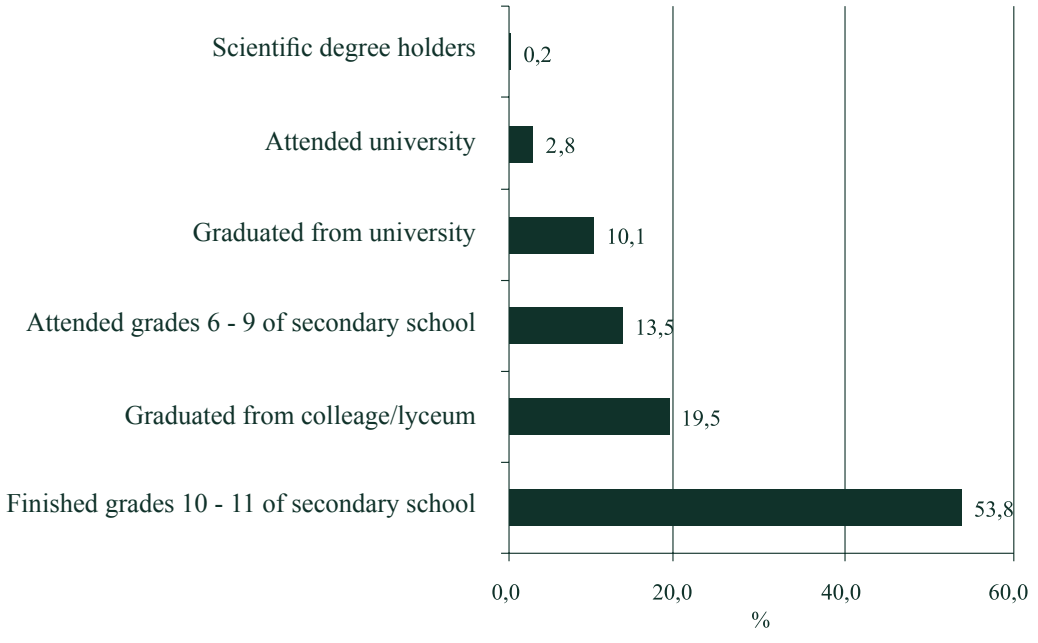
Like the previous respondents, drivers pollute roadside areas by leaving rubbish and other items after carrying out car repairs.

Drivers are part of the category of people who are not residents of the Suusamyr Valley and are passers-by who are not really interested in environmental issues and protecting natural resources. They are mostly interested in problems related to their regions and not the Suusamyr Valley.

People

The survey revealed that most Suusamyr Valley residents are ethnic Kyrgyz and are very friendly and open respondents. The average household has 5.5 people and most respondents have high school diplomas. Only 10% of those surveyed said that they have university diplomas.

Figure 2.1. Educational Level of Respondents



Specialists with higher education (university) and incomplete higher education are employed in the health and education sectors.

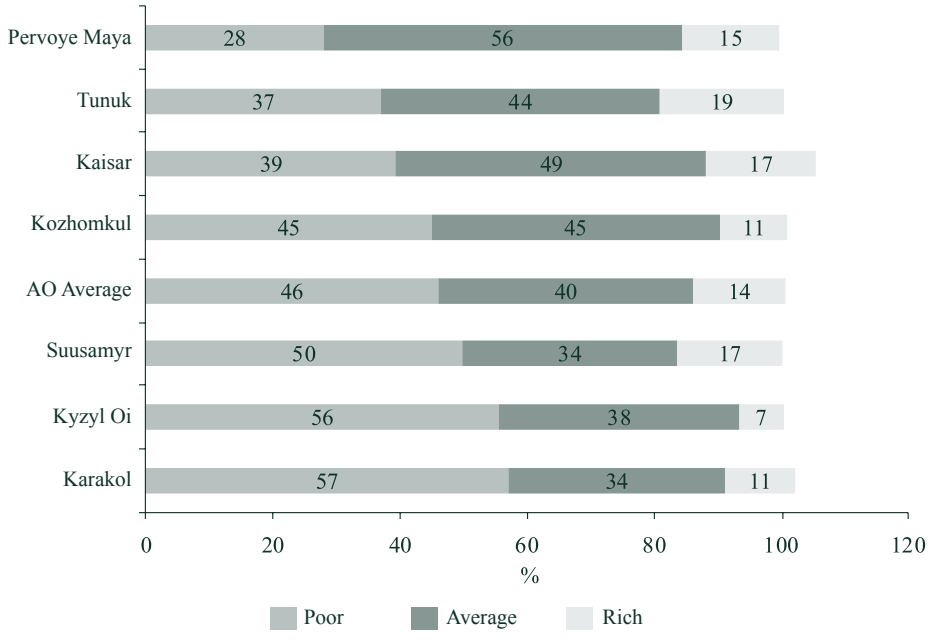
The majority of Suusamyr Ayil Okmotu (AO) residents rely on livestock farming (86%) and fewer (14%) on other employment areas like trade and entrepreneurship.

3. CHARACTERISTICS OF HOUSEHOLDS

Poverty

To determine the subjective poverty level all respondents were asked to determine how many families in the village were poor, had average incomes or were well-off.

Figure 3.1. Subjective Poverty Assessment by Residents



According to people's assessment nearly 46% of families in Suusamyr AO are poor, 40% have average incomes and approximately 14% are considered rich. Analysis of the subjective assessments by place of residence helps identify the poorest and richest villages in the AO as perceived by local residents. Thus, among the poorest villages in the AO we could name Kara-kol (57%), Kyzyl-Oi (56%), and Suusamyr (50%) where the number of poor families, as perceived by the residents, is higher than average for the AO. Kozhomkul, Kaysar and Tunuk villages could be categorized as average, with a perceived poverty level of 37-45%. Pervoye Maya village according to respondents could be considered rich – only about one third of households (28%) were perceived as poor and most households were considered to have average incomes.

Rich families could be found in every village and their average number in the AO is 14%, most of whom according to respondents, live in Tunuk, Kaysar, and Suusamyr villages (17-19%) and fewest – in Kyzyl Oi (7%).

Table 3.1. Average Household Profiles

	Land, hectares	Number of sheep/ goats	Number of horses	Number of cattle	Transport vehicles	Agricultural machinery
Poor family	5,9	2,9	0,2	0,4	0	0
Average family	11,3	29,5	2,25	2,72	0,38	0
Rich family	27,5	250	24,8	13,8	1,37	1,3

From Table 2.1 we can see that poor families have about six hectares of land, up to three sheep/goats, and rarely a cow or a horse. Poor families do not own a car or agricultural machinery.

Households with average incomes, according to respondents, have twice as much land and more livestock. Some families have Soviet-made cars. Like poor families, households with average incomes do not own agricultural machinery.

Rich families own substantially bigger land plots of up to 27.5 hectares, several hundred head of sheep/goats and dozens of horses and cattle. These households have one and sometimes two cars, and own agricultural machinery.

Based on these data, we can say with a good degree of certainty that the gap between rich and poor, poor and average families is significant and insurmountable for most poor families.

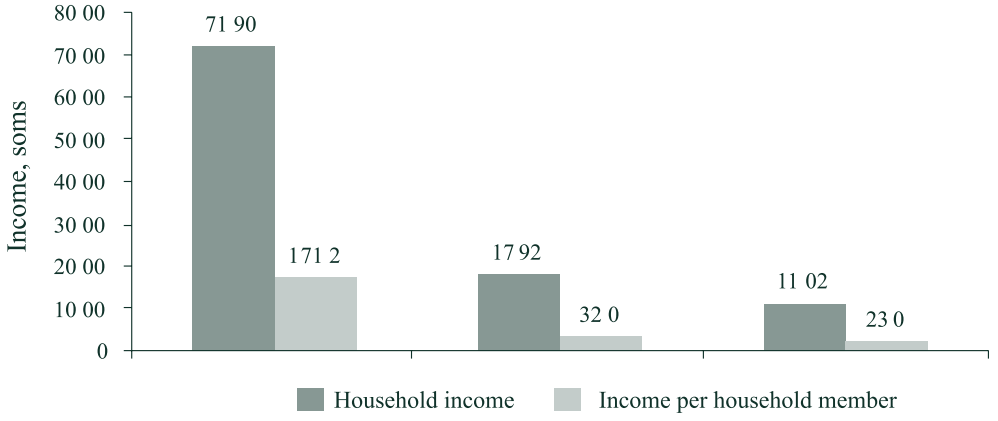
When asked to assess their own standard of living, the number of respondents who consider their households poor or rich fell sharply (27% and 1%, respectively).

Income

Study of the income structure showed that:

- 86% of the population rely on livestock farming and
- 14% rely on other sources of employment such as trade, entrepreneurship, civil service, production.

Figure3.2. Income Level by Types of Households



According to the respondents the average monthly income of households in Suusamyr AO is 335.6 soms per household member and nearly 16% of households do not receive any income and rely on subsistence farming.

Rich families have incomes of up to 7,190 soms per family and 1,712 soms per household member, families with average and low incomes receive 1,792 soms and 320 soms and 1,102 soms and 230 soms, respectively. It is important to note that families with average and low incomes have almost the same income per household member as rich families, which indicates a major poverty gap in the Suusamyr Valley.

Sources of income stated by respondents are shown in Chart 2.3.

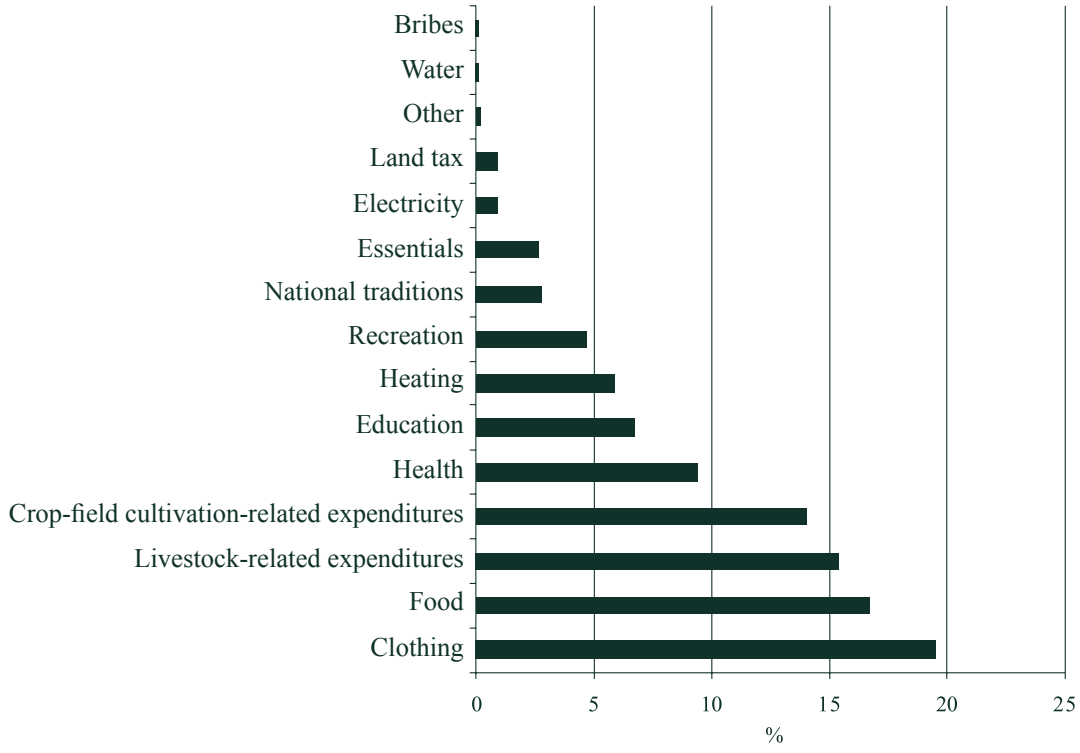
Figure 3.3. Income Sources

The Figure above shows that the highest paid area of employment is private business at up to 4,000 soms per month and the civil service at 2,700 soms. In descending order we see such occupations as baker, policeman and construction worker. The lowest incomes are found among pensioners, guards and cleaning staff and recipients of child benefits.

Structure of Expenditures

Analysis of average data on household expenditures in the surveyed villages showed that the expenditure side of the budget consists mainly of 12 items (Chart 2.4). The largest expenditure items are food and clothing purchases (36%). The next largest expenditure items are related to livestock farming (17%) and field-crop cultivation (15%). Only around 9% of the family budget is spent on health and slightly less on education (7%). About 6% is spent on heating and cooking. Further analysis shows that recreation accounts for almost as much as observing national customs and purchasing essentials combined.

Chart 3.4. Breakdown of Expenditures for Surveyed Households



As we can see survey respondents reported that land tax was not a burden and accounted for less than one percent of family budgets.

Other expenditures (observance of national traditions and customs, electricity, land tax etc.) are relatively minor and together do not exceed 7%.

It is important to note that practically no corruption or bribery was reported in this locality and this was confirmed throughout the survey period.

Thus, we can conclude that for residents of the surveyed area livestock breeding and field-crop cultivation are the two principal areas of employment that take the most out of the family budget.

Expenditures on Field-crop Cultivation and Livestock Breeding

This finding is supported by the structure of expenditures on field-crop cultivation and livestock breeding if looked at individually. As can be seen from the charts below, expenditures on ploughing (payment for machinery, fuel, etc), harvesting and seeds are the mains ones in field-crop cultivation. Expenditures on mineral fertilizers are minimal, due to high cost and unavailability.

Figure 3.5. Breakdown of Expenditures on Field-crop Cultivation and Livestock Breeding

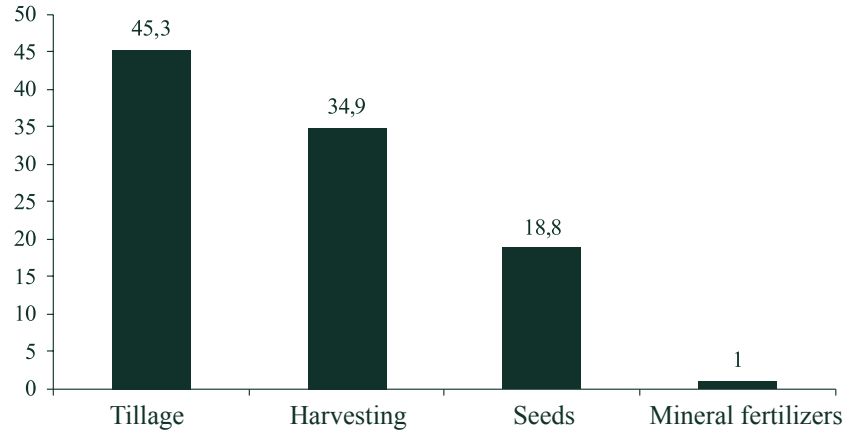
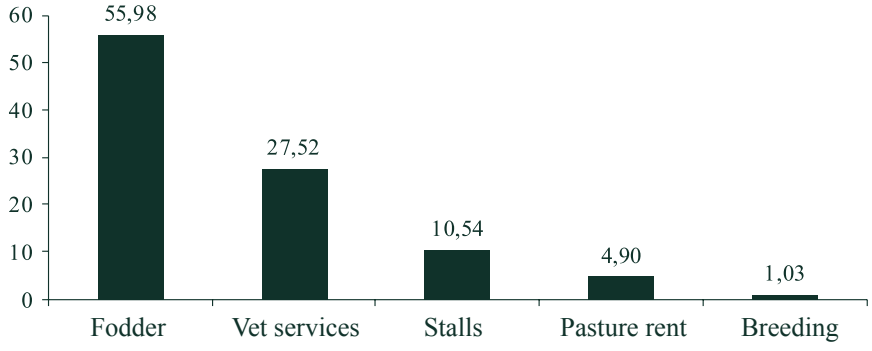


Figure 3.6. Breakdown of Expenditures on Livestock Breeding



Most expenditure on livestock farming goes on fodder and vet services. Note that breeding expenditures are almost absent, which suggests that there is no breeding or it is insignificant in Suusamyr Valley villages.

4. CHARACTERISTICS OF FARMS

Organization of farms

According to respondents, relatively large numbers of people (75%) have personal farms and are categorized as peasant farms and are legal entities or farms that are not legal entities. The activities of such farms are based mostly on personal labour by family members, relatives and other people who jointly grow agricultural produce. In this situation the land and other property belongs to members of the peasant farm (as owners) or are leased officially to a registered peasant farm.

Only a few residents (around 1%) have united into collective farms. Collective farms include agricultural cooperatives, joint stock companies, all types of associations and collective peasant farms. In the Suusamyr Valley collective peasant farms are widespread.

In general we can say that new forms of organization such as agricultural cooperatives have not taken root in the valley. To develop the agricultural sector in line with the new Law on Cooperatives efforts should focus on creating production, service, trade, and other types of cooperatives.

Livestock and Export Opportunities

The survey showed that one of the problems in livestock farming is the lack of accurate statistics on the current numbers of livestock by types. In relation to this question we collected information from three sources:

- Form 7. Livestock head count (National Statistics Committee) on 1 January 2005
- Ayil Okmotu (village cluster authorities) – July 2005
- Population – August 2005

Table 3.1 shows data on livestock numbers by source of information. It is clear that the data from the first two sources is similar but differs from the numbers reported by residents themselves. We are inclined to think that data received from residents needs to be interpreted with caution[2]. Our assumption is based on the fact that ayil okmotu can provide only estimated figures for July, which do not take into account births and the authorities are interested in underreporting statistics on livestock to account for increased meat production, which is included in calculating the GDP of the district or region. In reality, most livestock slaughtering occurs in autumn, while in summer it is minimal.

Table 4.1. Livestock per Household by Source of Data

	National Statistics Committee	Ayil Okmotu	Residents (arithmetical average)	Arithmetical average error
Cattle	2,0	2,1	3,11	0,2
Sheep and goats	14,7	16,3	23,4	1,8
Horses	0,15	1,9	1,86	0,17
Poultry	3,5	3,5	5,55	0,5

Arithmetical average and median taking into account standard error - show that households in the Suusamyr Valley rely heavily on livestock farming.

Disparities in the numbers of reported livestock increased the arithmetical average but did not negatively affect the admissible error. Note that the median, indicating numbers of responses, gives a higher probabilistic error than average, especially for the 'sheep/goats' item. For this reason, from now on for our analysis we will use the arithmetical average.

On average there are three head of cattle per household. Responses ranged from 1 (31% of respondents) to 90 head (less than 1% of respondents) per household. At the same time 59.2% of respondents said that they have 2-3 head of cattle, 22.8% - 4-10 head and 1.1% - 11-13 head and about 2.4% - 14-90 head.

About 20.7% of households do not own sheep or goats, 30.1% have 2-10 head of sheep/goats, 29.8% from 11-30 head, 16.8% from 30 to 100 head and 2.6 % from 100 to 650 head.

36% of households do not own horses, 42.7% own 1 or 2 horses, 19.8% own from 3 to 10 horses and 1.4% from 11 to 80 horses. Note that the maximum number of horses was 80 head.

The majority of residents (99.3%) are not engaged in yak breeding and the maximum number of yaks reported per household was 30.

56.3% of families do not have poultry. 14.6% own 1 - 6 birds, 20.4% from 7- 15, 7.2% from 15 to 30 and only 1.5% have 40-200.

[2] Survey objectives did not include counting livestock by type. Information was gathered from the respondents

Table 4.2. Number of Livestock per Household and Export Opportunities (arithmetical average), by livestock type

	Cattle	Of which, cows	Sheep and goats	Horses	Yaks	Poultry
Current number of livestock	3,11	2,03	23,04	1,86	0,8	5,55
Could be sold without harm for the farm	1,12	0,33	2,95	0,18	0	0,24

In order to explore export opportunities, we asked each respondent to answer the question "How many head of livestock (by type) could you sell without harming your farm this year?" Analysis of replies showed that Suusamyr Valley residents could sell some of their cattle and sheep/goats. There is no motivation to sell cows that are kept mostly for breeding and milk (consumed by the family). People are not inclined to sell poultry and yaks either - poultry because of their high profitability and small numbers and yaks because of low selling prices. With sufficient motivation – presence of a sausage-making unit and dairy - residents could sell a lot of meat and milk. In our opinion, one of the export opportunities for the Suusamyr Valley lies in marketing thoroughbred horses.

Distribution and improvement of breeds in the Suusamyr Valley

Each respondent was asked a question about the most widespread breeds of cattle and sheep in their village. In response to this question people used the phrase - "local breed".

It turned out that no breeding improvement activities are carried out in the villages and nearly 90% of respondents agreed with this statement. Most of the cattle and sheep are of mixed breeds and their fleeces are coarse, which reduces export demand for their wool. According to shepherds, this year demand for fleeces dwindled to zero. Last year young entrepreneurs came and bought some fleeces.

It seems to us that people need to be systematically told about the advantages of high yield livestock farming (for instance, fine-fleeced and Ghisar sheep breeding) and careful breeding activities. Loans for purchasing and breeding high-yield sheep, goats, and cattle would be very helpful for the local population. High-yield breeding activities in the valley should be closely monitored.

It is important to have a government policy on breeding and promoting breeding farms that could produce and test types of livestock suitable for different localities.

It was interesting to learn the selling prices and where Suusamyr AO livestock goes. The Table below shows prices by type of livestock.

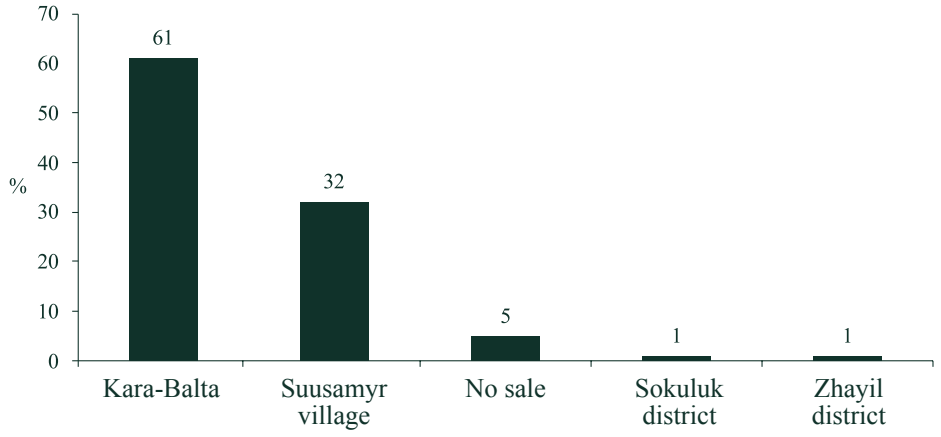
Table 4.3. Selling Price Range

	Price range, soms	Maximum price, soms
Cattle	9-15 thousand	20 thousand
Cows	10-18 thousand	20 thousand
Bulls	3-8 thousand	10 thousand
Calves	1-4 thousand	6 thousand
Sheep/goats	1.5-3 thousand	3.5 thousand
Horses	15-20 thousand	25 thousand
Yaks	0	-
Poultry	50-70	100

The main difficulty in selling livestock is transport and it costs up to 500 soms to transport one horse to the bazaar in Kara-Balta, so people only take livestock to the nearest large market if they have money and time, otherwise they sell their livestock in the local market in Suusamyr Village.

The Figure below shows the main livestock markets

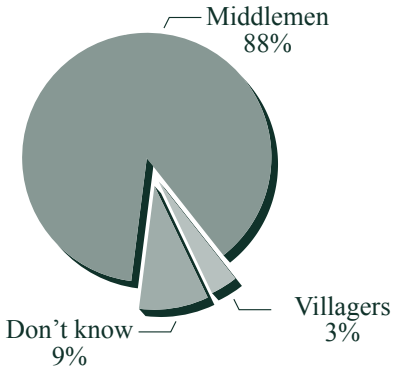
Figure 4.1. Livestock Markets



Most people sell live livestock in the Chui province markets and Kara-Balta is the nearest large market and more than half (61%) of the meat products are taken there. Most wholesale buyers come to Suusamyr Village. Note that about 5% of households don't sell livestock at all. As the chart shows, most people cannot transport livestock further than Kara-Balta, but deliveries of meat to the markets of Bishkek and Tokmak would give producers from the Suusamyr Valley access to Kazakhstan's market.

Livestock is sold mostly to middlemen who are present at all markets. Note that moving meat from the producer to Bishkek raises the price of a kilo of meat by 50%. About 3% of livestock is sold by live weight to local residents who buy livestock from fellow villagers for breeding.

Figure 4.2. Buyers of Suusamyr Valley Meat



It is important to mention that in respect of meat sales Suusamyr Valley is cut off from markets in the south of the country, Kazakhstan, and Uzbekistan.

Availability of fodder

In answer to the question "Have you got enough of your own fodder for your livestock?" a large number of respondents (nearly 70%) said that they did, however, about a quarter of respondents said that they did not have enough of their own fodder mainly due to keeping too many animals. People compensate for the lack of fodder by cutting grass on unused land. Purchased fodder includes fodder mixes (3-4 soms per kilo) and hay (1-2 soms per kilo). There are practically no fodder sales in the Suusamyr Valley. Only 2% of respondents said that they had sold fodder but there were instances when people had sold 2-20 tons of fodder.

5. SUUSAMYR VALLEY PASTURES

Use and condition of pastures

According to respondents, people use mostly near-village (55%) and remote pastures (52%). Only one out of ten households relies on intensively-used pastures.

Pasture use changes with the seasons. Remote and intensively-used pastures are used mainly in spring and summer and near-village pastures - year round. Overgrazing on near-village pastures in the summer leads to degradation. Residents of Kozhomkul and Suusamyr villages use near-village pastures mainly in the summer due to not wanting to take livestock to remote pastures and leave their homes in the summer.

Legislative support and activities aimed at improving living conditions on remote pastures and intensively-used pastures, higher rents for near-village pastures depending on the time of the year and tighter control over the use of all types of pastures could help reduce pressure on near-village pastures in the summer.

Figure 5.1. Use of Intensively-used Pastures, by season

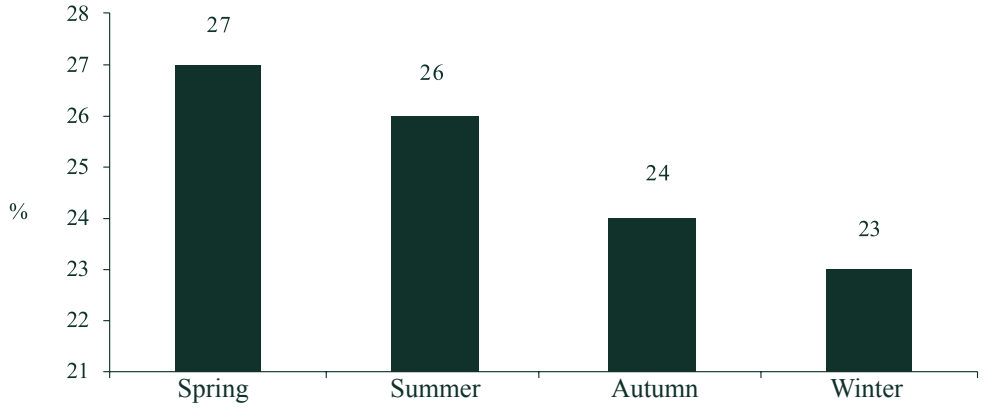


Figure 5.2. Use of Distant Pastures, by season

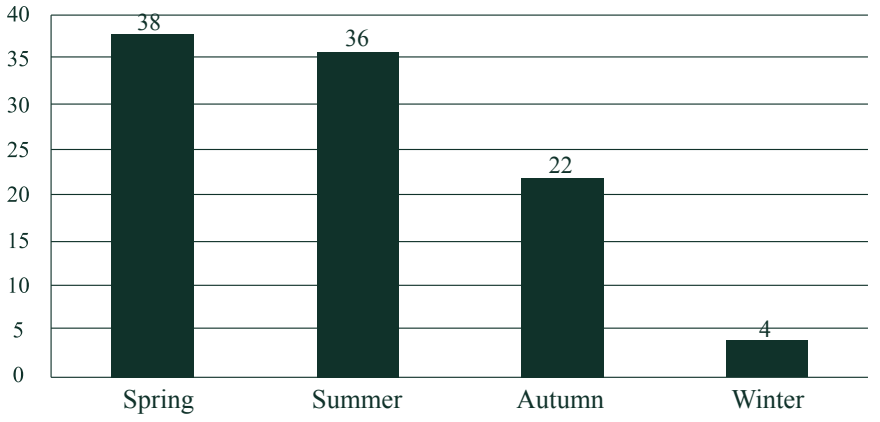
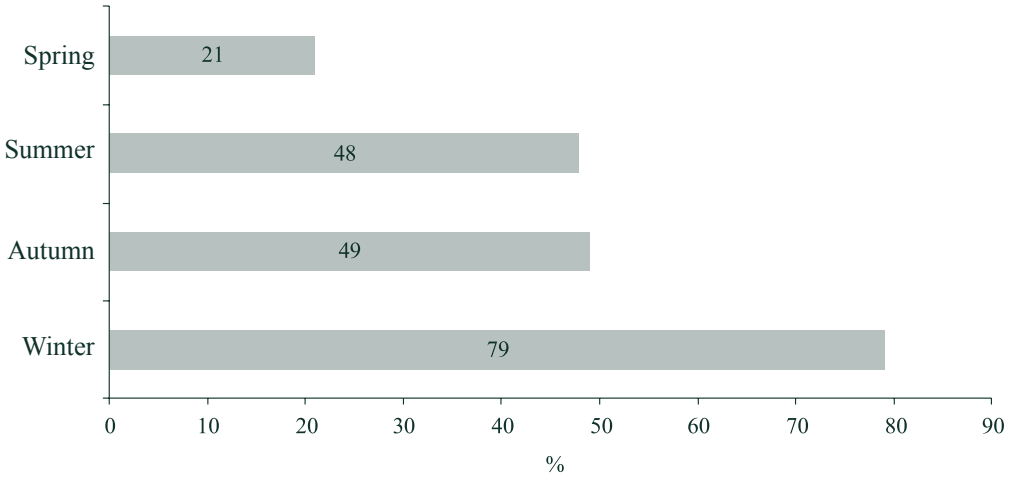


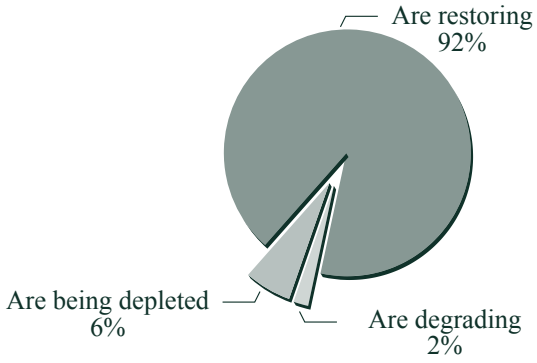
Figure 5.3. Use of Near-village Pastures, by season



However, with all the drawbacks, use of pastures in recent years has not led to their degradation and the hypothesis about the degradation of pastures in Suusamyr was disproved.

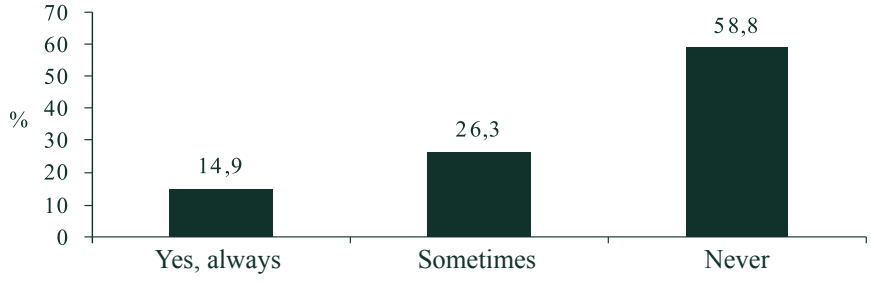
The vast majority of residents (over 90%) said that in the past 10-15 years all types of pastures have gradually recovered, however, even given this overall improvement, respondents say that near-village pastures have become somewhat degraded. The number of respondents who drew attention to degradation of near-village pastures was 5-6 times higher than for other types of pastures.

Figure 5.4. Changes in the Condition of Pastures in the past 10-15years



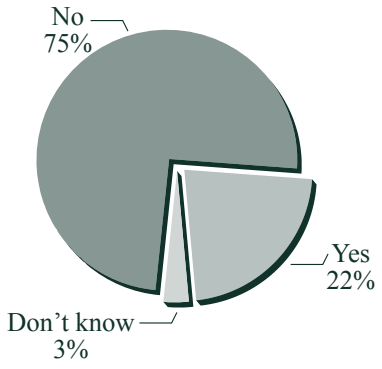
Residents think that remote pastures have degraded mainly because no fertilizers have been added, intensively-used pastures have degraded because of land erosion caused by rainfall and near-village pastures because people use them without limiting the number of head per hectare of pasture.
Figure 4.5 shows that nearly 85% of people do not follow pasture rotation practices

Figure 5.5. Pasture Rotation Practices



Among common factors leading to the destruction of pastures respondents mentioned the lack of control over the use of Suusamyr Valley pastures. It is clear that scientifically-sound work is needed on the use of pastures, which should take into account pressure per hectare and pasture rotation.

Figure 5.6. Availability of Special Livestock-Driving and Livestock Platforms



According to the answers, people are not aware of what cattle platforms are, but are knowledgeable about cattle driving. Although most respondents did not confirm the availability of special cattle drives or platforms all respondents said that they have no problems related to cattle driving. 97% of respondents said that as regards cattle driving everything is done properly due mainly to large free areas of pastures and the relatively small numbers of livestock.

Pasture rent, self-acquisition and use by private persons and companies

Relatively large numbers of respondents (nearly 90%) think that newly arrived businessmen, deputies and large firms do not really use Suusamyr Valley pastures.

Most pastures are rented by local residents. Payment for one hectare is official and amounts to about 23 soms a month. Cases of corruption, nepotism and such were not reported.

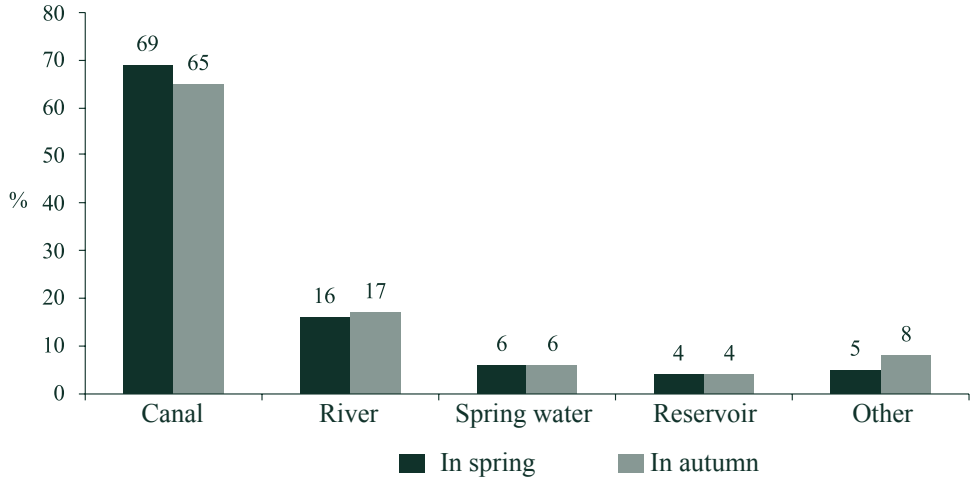
Answering the question "Please name places that have been illegally taken over" people mentioned Sandyk, Berdibai tract, Ak-Sai, Torpu, Kyrgak-Aikyn, Kara-Kol, Suulu tor, Novyi Put, Aramza, Zhoon –Dobo, Ak-Suu, Tokoilu, and Uch emchek.

6. ECOLOGY

Livestock watering ponds

Talks with villagers and shepherds revealed no problems with livestock watering ponds in the Suusamyr Valley. In more than 80 cases out of 100 canals and rivers are used as livestock watering ponds and in approximately 10 cases out of 100 livestock can drink from springs and reservoirs. No seasonal fluctuations in the situation were observed.

Figure 6.1. Sources of Drinking Water for Livestock



Most livestock ponds do not have drinking facilities, but most respondents think that this does not affect pollution and swamping of water sources and drinking places. Experts and specialists whom we consulted said that there was no need to create drinking facilities around livestock ponds because of the relatively small numbers of livestock and cost of such facilities.

Figure 6.2. Availability of Facilities at Livestock Drinking Sites

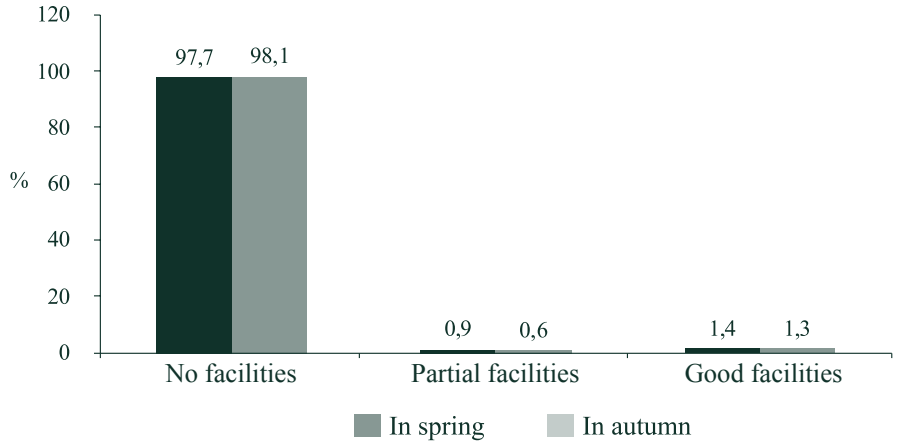
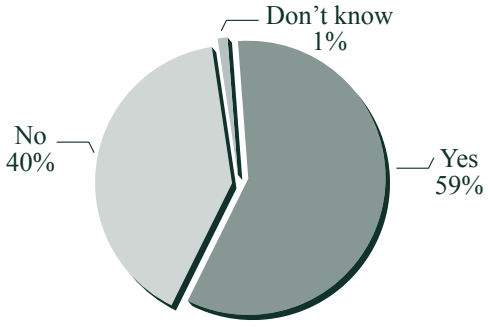
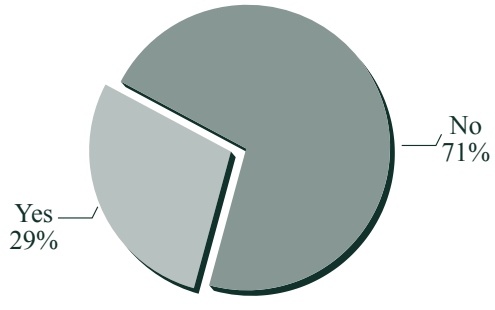


Figure 6.3. Observance of Livestock Watering Regimes



According to residents, in half of all cases they observe livestock watering regimes. Two out of three agree with this opinion. About 40% of respondents said that they do not observe livestock watering regimes.

Figure 6.4. People's Opinions About Pollution and the Swamping of Water Sources



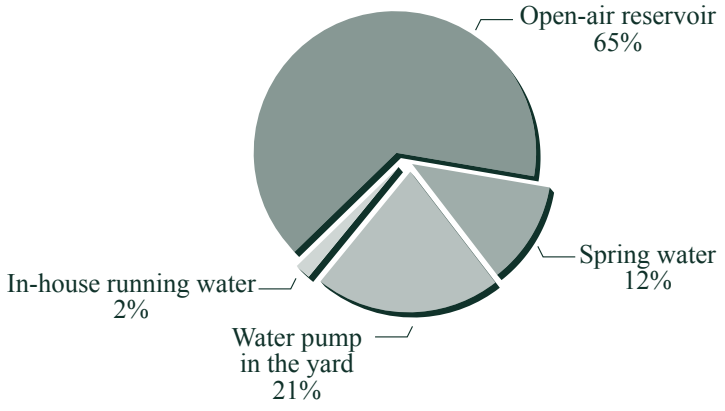
These conditions have little effect on the pollution of water sources. A relatively large number of respondents (71%) think that water sources are not being polluted. At the same time some respondents – one in four - said that water sources are being polluted. There were practically no respondents who had difficulties in assessing the situation with pollution of water sources.

Access to Drinking Water

Suusamyr residents remember that during Soviet times the Suusamyr Valley had several artesian wells, which are not working now because their motors have burned out. Nobody is involved in rebuilding wells.

About 80% of the population obtains drinking water from natural water sources and springs, one in five from water pumps in the yard and 2% can boast indoor running water. Nobody said that they had to bring water from the neighbouring village.

Figure 6.5. Sources of drinking water

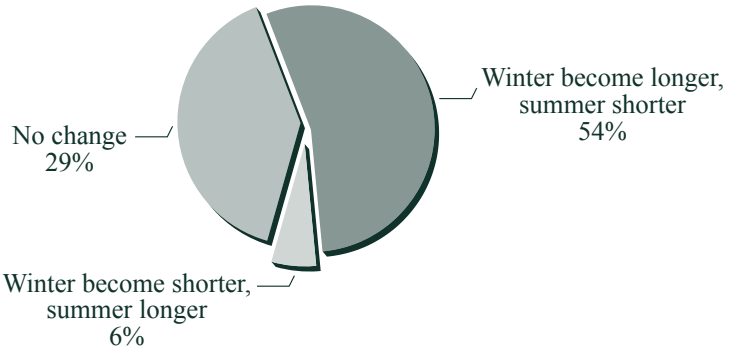


Climate

The Suusamyr Valley has a peculiar climate and winter covers the valley for practically 7-8 months a year. According to local residents the climate is slowly changing.

Most respondents think that the climate has changed dramatically in the past 15 years. More than half (54%) support this point of view stating that the winters have become longer and summers shorter, whilst two fifths (40%) of respondents said that the climate has not changed.

Figure 6.6. Climate Change in the past 15 years



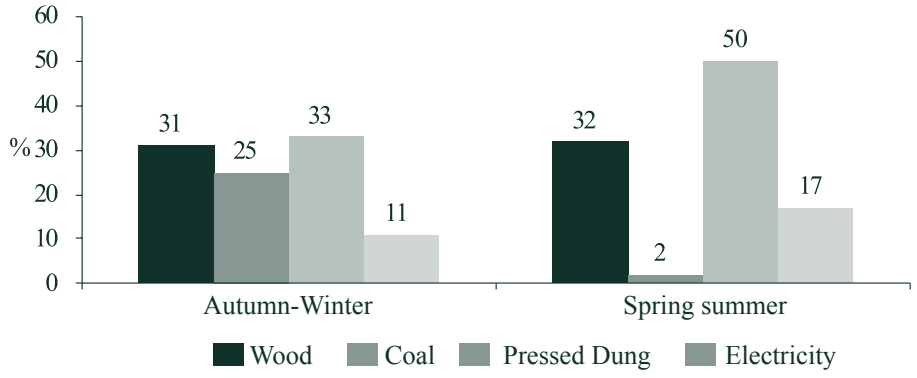
Types of Fuel Used

Due to the climatic conditions, problems related to heating houses, cooking and general energy availability are becoming more acute.

In response to the question about the main sources of fuel, respondents gave various answers. Aggregated results are shown below.

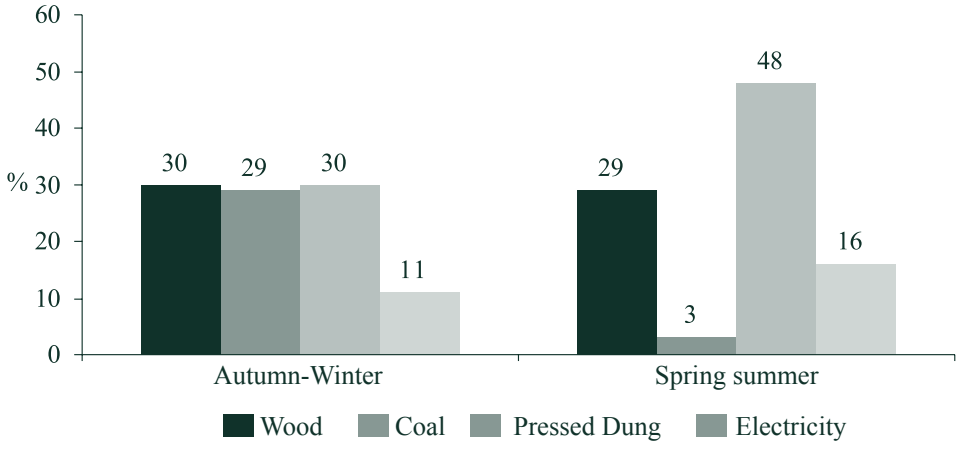
To heat houses in autumn-winter people use all types of fuel equally, except for electricity, which is not very accessible or affordable for most residents of this mountain valley. During spring-summer wood and pressed dung, stockpiled by the residents themselves are the main source of heating for houses.

Figure 6.7. Types of Fuel used for Heating Houses



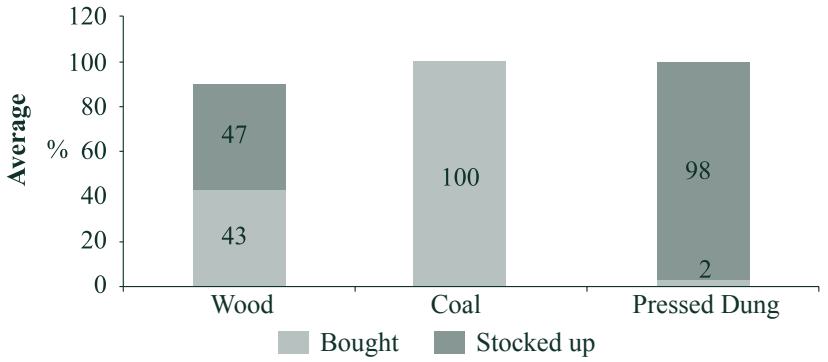
A similar situation applies to types of fuel used for cooking. In many cases this could be explained by the fact that usually the house is built in such a way that food is cooked on the same stove that heats the house.

Figure 6.8. Types of Fuel used for Cooking



While pressed dung is stockpiled by the families themselves, 43% of wood is bought in the local market.

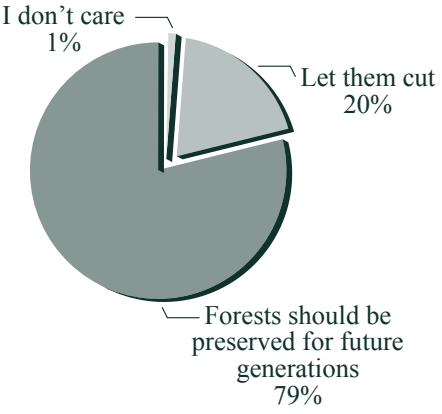
Figure 6.9. Sources of Fuel



Cutting down trees

Since wood is one of the main sources of heat it was interesting to learn people's opinions about cutting down flood plain forests.

Figure 6.10. What is Your Opinion about Cutting Down Flood plain Forests?



Nearly 80% of Suusamyr residents realize the importance of saving these forests for future generations. Some residents cut down trees but every year plant new ones, guaranteeing supplies of wood for heating in the future, whilst one in five had a different position.

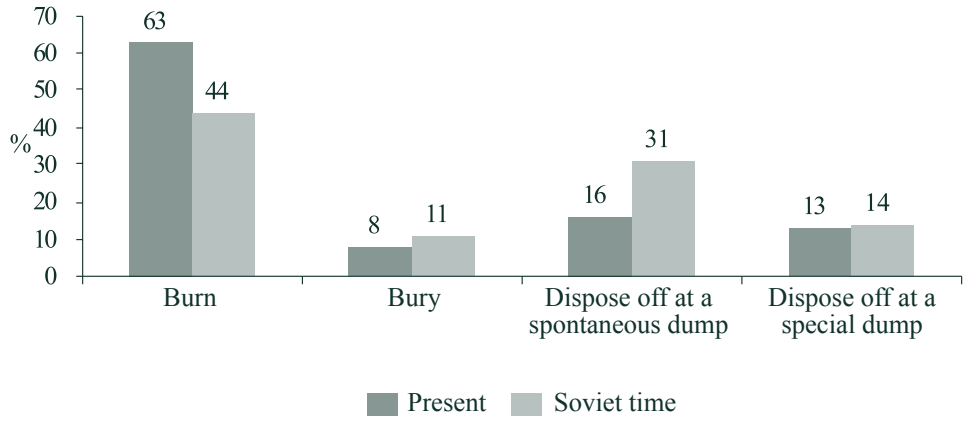
"What can I do? We are forced to cut down trees. Why think about the future when we could die of hunger and cold today?"

We often heard people complain about the high price of coal:

"Who would cut down the forest if coal was not so expensive?"

Ways of Disposing of Waste

Figure 6.11. Ways of Disposing of Waste



As the Figure shows, although 15 years have passed since the collapse of the Soviet Union waste disposal practices remain unchanged. It is notable that people have been able to maintain the special waste dumps allocated during Soviet times.

The most widespread way of waste disposal is by burning and the percentage of the population preferring this way of waste disposal has increased by 20% – from 44% to 63%. The second most widespread method is dumping in «spontaneous dumps». Note that while 31% of residents resorted to this method during Soviet times the number has since halved to 16%.

We got the impression that roadside trading and cafes are the main environmental scourge of the Suusamyr Valley and the main cause of river pollution and degradation of roadside pastures.

Problems with the lack of waste containers and hard standings for waste containers have impacted on

7. PASTURE MANAGEMENT

Attitude to the pasture management regime

Studying people's attitudes to pasture management covered several issues: observance of Government Resolution № 360 On the procedure for leasing and using income from pastures and distributing money from pasture leases by tenants; should pastures be rented out on long-term leases; who should manage pastures and why; assessment of existing management arrangements; people's attitudes to installing facilities near livestock watering sites; people's attitudes to introducing community-based pasture management schemes and the probability of creating such communities in the Suusamyr Valley.

The survey helped reveal the following:

- People are poorly informed about the legislation on pastures;
- Tenant farmers have a poor awareness of their rights and obligations;
- Legislation concerning periods of grazing, changing grazing areas and building pens is virtually not observed;
- Tenant farmers could not name activities for protecting pastures from wind, water and other types of erosion;
- Pastures are not monitored for rotation.

One of the possible reasons for this is a lack of motivation to follow the Resolution due to the large areas of unused pastures and relatively small numbers of livestock on the pastures.

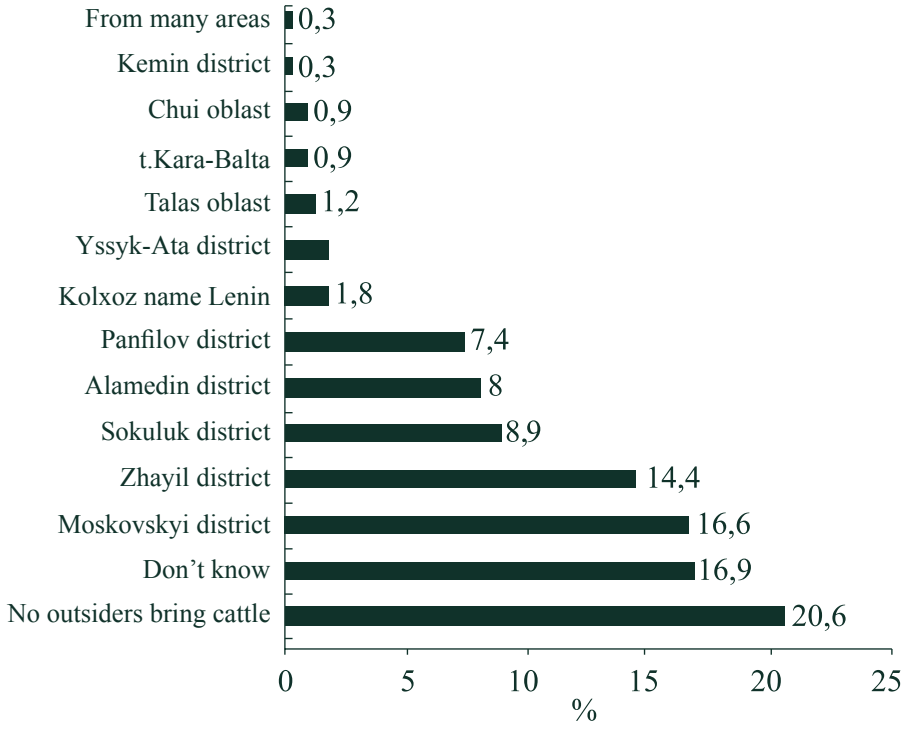
Figure 26 shows user categories of Suusamyr pastures and makes it clear that neighbouring districts of Chui province are the principal users of Suusamyr Valley pastures. Pastures are used by people from Talas province less often. Nobody from southern regions of the country or from Kazakhstan use the pastures.

It should be noted that there is a lack of information about who uses what kind of pastures in Suusamyr Aiyl Okmotu and experts found it difficult to answer the question about who collects this information and what agency supervises this issue. It was assumed that possibly the area or province level authorities collect this kind of information. According to the Resolution these powers are given to Gosregistr.

The State Agency on Registering Rights to Immovable Property under the Government of the Kyrgyz Republic (Gosregistr) has to analyse the legality of providing pastures to legal and physical persons from 1991 up till now and submit proposals to the Government of the Kyrgyz Republic

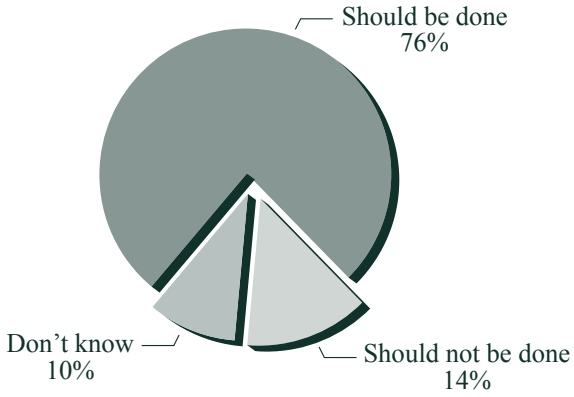
Government Resolution № 360 as. of july 4, 2002

Figure 7.1. Pasture Users



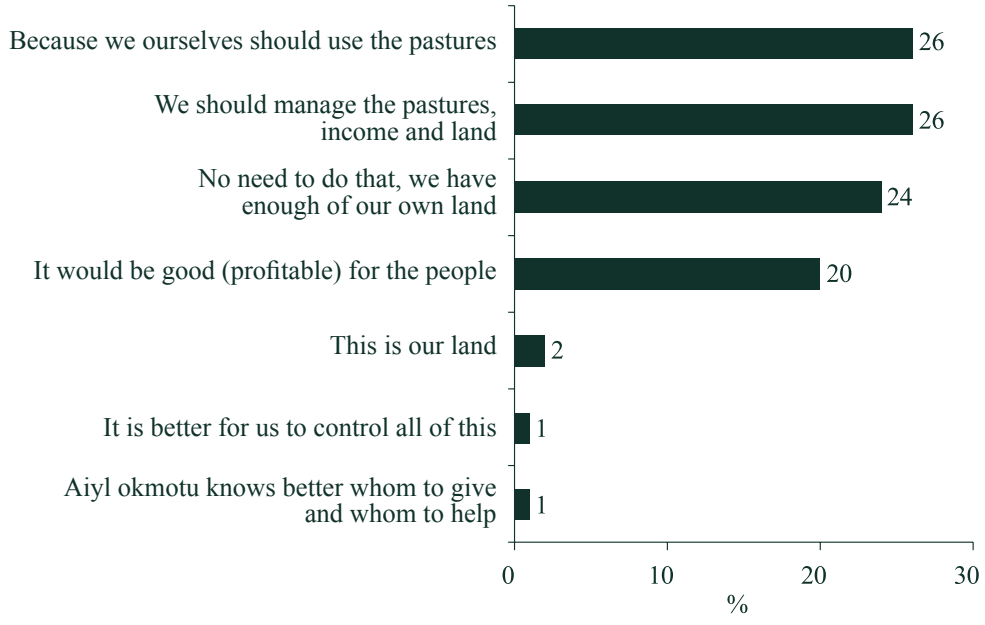
At the same time most people (76%) believe that all pastures should be managed by Suusamyr Aiyl Okmotu and the remainder either support the opposite point of view or have difficulties answering this question.

Figure 7.2. People's Opinions about Transferring all Pastures to be managed by Suusamyr Ayil Okmotu



The most frequently cited argument in support of this decision was that "We should use, manage and receive the income from our pastures ourselves." After a detailed explanation of the question 10% of residents decided to change their position regarding the need to transfer pastures to Suusamyr AO. Overall, about one fifth of residents said that pastures should not be given to Suusamyr AO, since "there is enough of our own land." In our opinion the shifting opinions of this category of respondents has to do with poor awareness of the matter and thus, in making serious decisions, should not be taken as absolute.

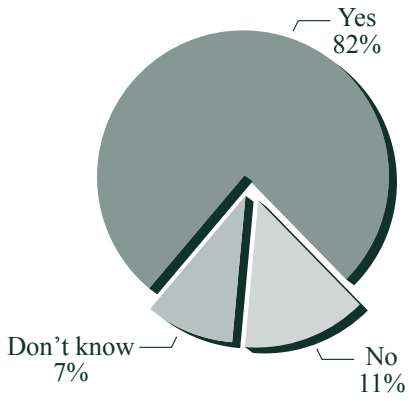
Figure 7.3. Motivation for Transferring Pastures to the Management of Suusamyr Aiyl Okmotu



According to the legislation rent revenues from near-village, remote and intensively-used pastures are distributed in different ways.

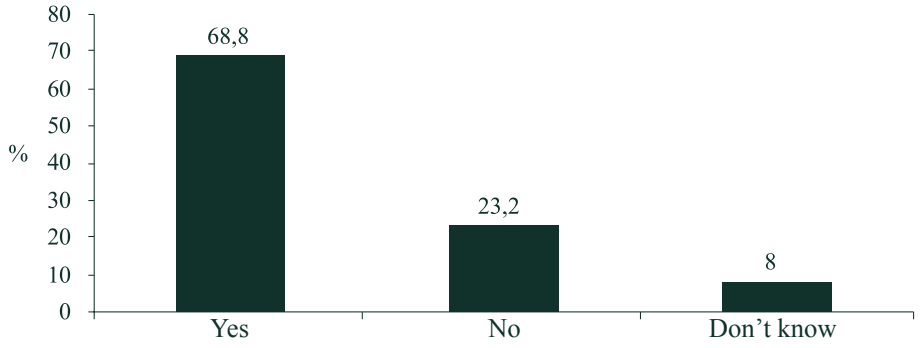
As the survey showed, 82 percent of people think that rent revenues for remote pastures should be left in the local budget. According to ayil okmotu representatives at present money from renting out near-village pastures stays within the ayil okmotu, but the rent is too small to even maintain any staff.

Figure 7.4. Opinions about Transferring Rent from Remote Pastures to the local budget



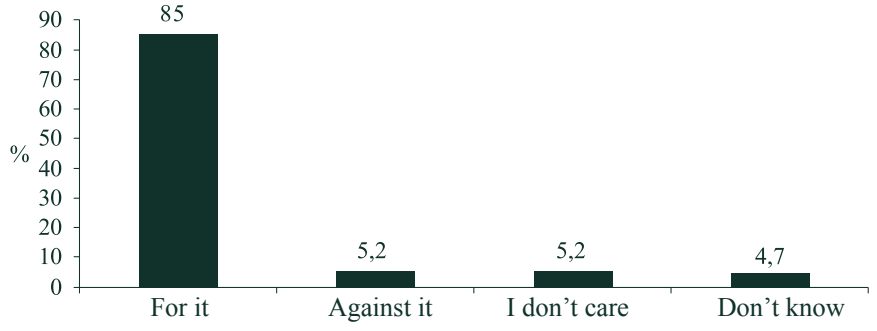
In general, many people are satisfied with the present form of pasture management. Approximately a quarter would like to see it change.

Figure 7.5. Satisfaction with Existing Pasture Management Arrangements



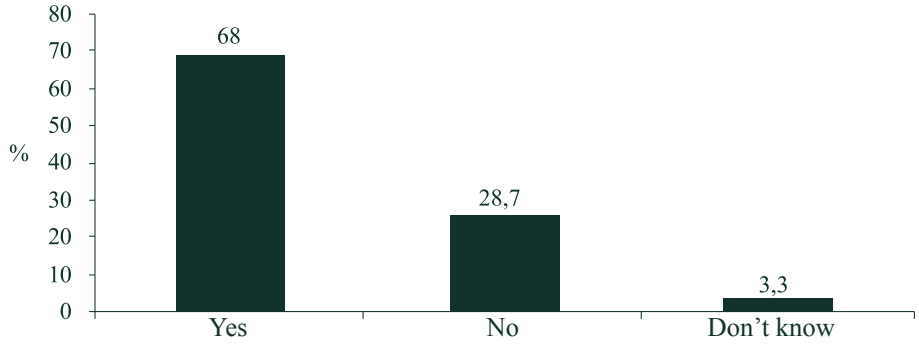
Changes in the pasture management regime should allow for long-term renting out and the development of community-based pasture management. 68% and 76% of respondents, respectively, hold this opinion. New forms of management and long-term use of pastures will encourage greater responsibility for pasture use, greater control by the community and a greater awareness by every member of the community.

Figure 7.6. People's Attitudes to Long-Term Renting out of Pastures



Although people have not created facilities at livestock watering sites and most do not see the need to do so due to the small numbers of livestock compared to Soviet times, 85% of Suusamyr Valley residents think that facilities are needed at livestock watering sites and they should be regulated.

Figure 7.7. People's Attitudes to Creating Facilities and Regulating (Limiting) Livestock Watering Sites



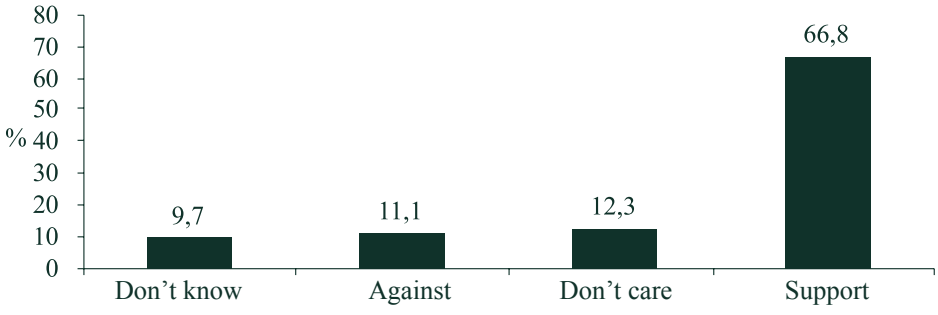
"Tenant farmers are obliged to:
- use pastures only for their intended purposes, preventing deterioration of the environmental situation as a result of their activities;
- observe pasture rotation practices, terms and lengths of grazing and prevent overgrazing of pastures;
- change summer grazing sites not less than every two weeks and return to the same spot as least one year after that;
- establish temporary animal pens at least 100 metres away from rivers and streams and sheep washing sites should be agreed with local environmental authorities and be located at least 300 metres away from protected water zones;
- carry out superficial and in-depth improvements to pastures in order to increase their productivity, prevent littering and polluting pastures and biological and chemical pollution of livestock watering sites;…"

Format of the agreement to rent pastures attached to Government Resolution # 360

Setting up Pasture Users Associations

Setting up pasture users associations and improving the existing system of pasture management were supported by the people. The Association would help producers not only sell their products in an organized way and find large buyers for meat, milk, kymyz (fermented mare's milk), but also raise the quality of their produce and develop support services.

Figure 7.8. Population's Support for Setting up Pasture User Associations (Commercial Livestock)



However, the survey revealed that people are not ready to unite into associations of their own accord and they are poorly aware of modern forms of cooperation and association. Thus, some respondents associate any form of unification with the collectivization of property and think such associations have no right to exist.

"Why should I cooperate? We will bring our livestock together like on Soviet collective farms then take turns to tend it, but somebody will overlook my sheep or exchange them for vodka. What will I do then?"

Associations should be created only after proper explanatory work, provision of legal support, improvements in the legislation and setting up mechanisms to legally protect association members and the property of each member

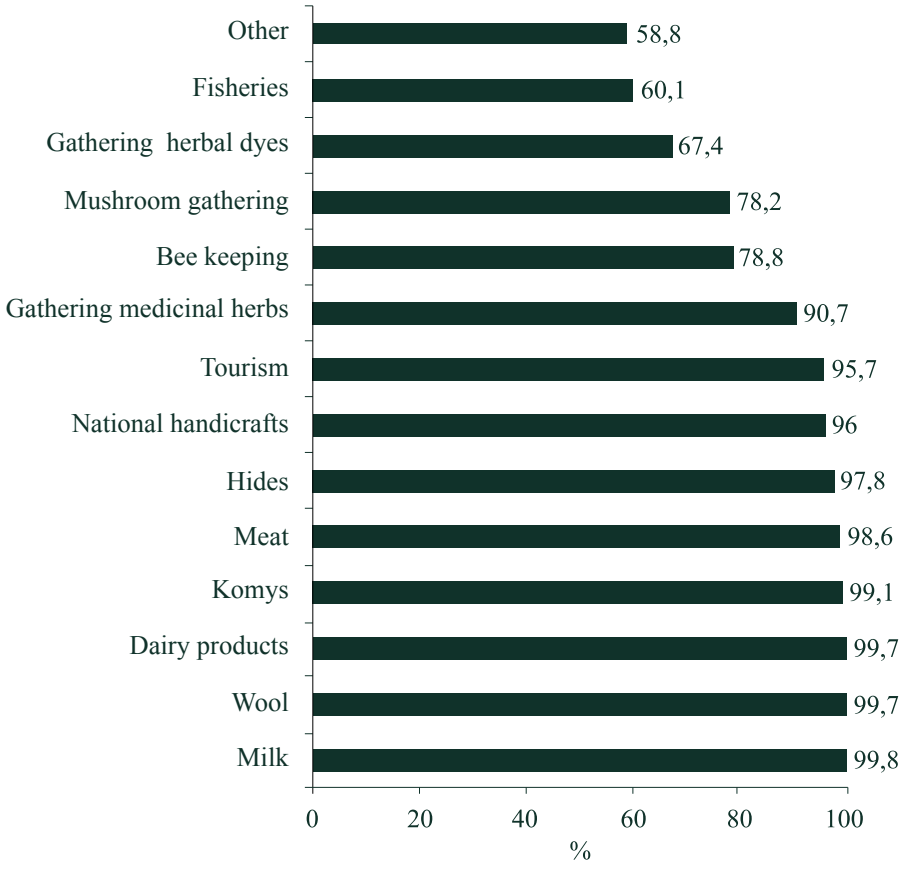
"First of all, with whom should I associate? Secondly, what for? I work a lot and that is why I am not poor. OK, let's say I joined the association. But I am sure there will be lazy bones among the members. So that means I will need to work not only for myself but for them as well"

It was clear that poor people were more eager to join associations than rich ones. Overall, 48% of respondents said that they would unite their land plots and about the same number (45%) was not ready to do that. 7% of respondents were undecided on the issue.

8. PROSPECTS FOR DEVELOPING NEW INCOME-GENERATING ACTIVITIES

Respondents were asked, "What profitable income-generating activities could be developed in the Suusamyr Valley?" A list of possible answers was given with the possibility of choosing 'other' in which case they were asked to elaborate.

Figure 8.1. Promising Income-Generating Sectors for the Suusamyr Valley

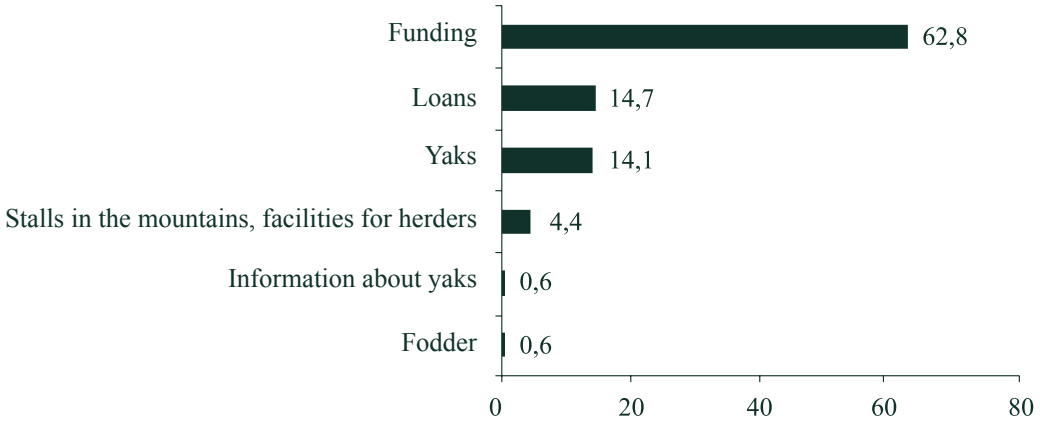


We can see from the answers that producing milk and dairy products, wool, kymyz, hides, national handicrafts and tourism are the most promising activities. Less promising are bee-keeping, gathering herbal dyes and fisheries.

Four out five respondents said that yak breeding was both profitable and promising and people are eager to start developing this sector.

"We would gladly develop yak breeding. Yaks are undemanding and feed themselves year round and do not need to be guarded from predators like other livestock and they don't need pens, but where can I buy a yak?"

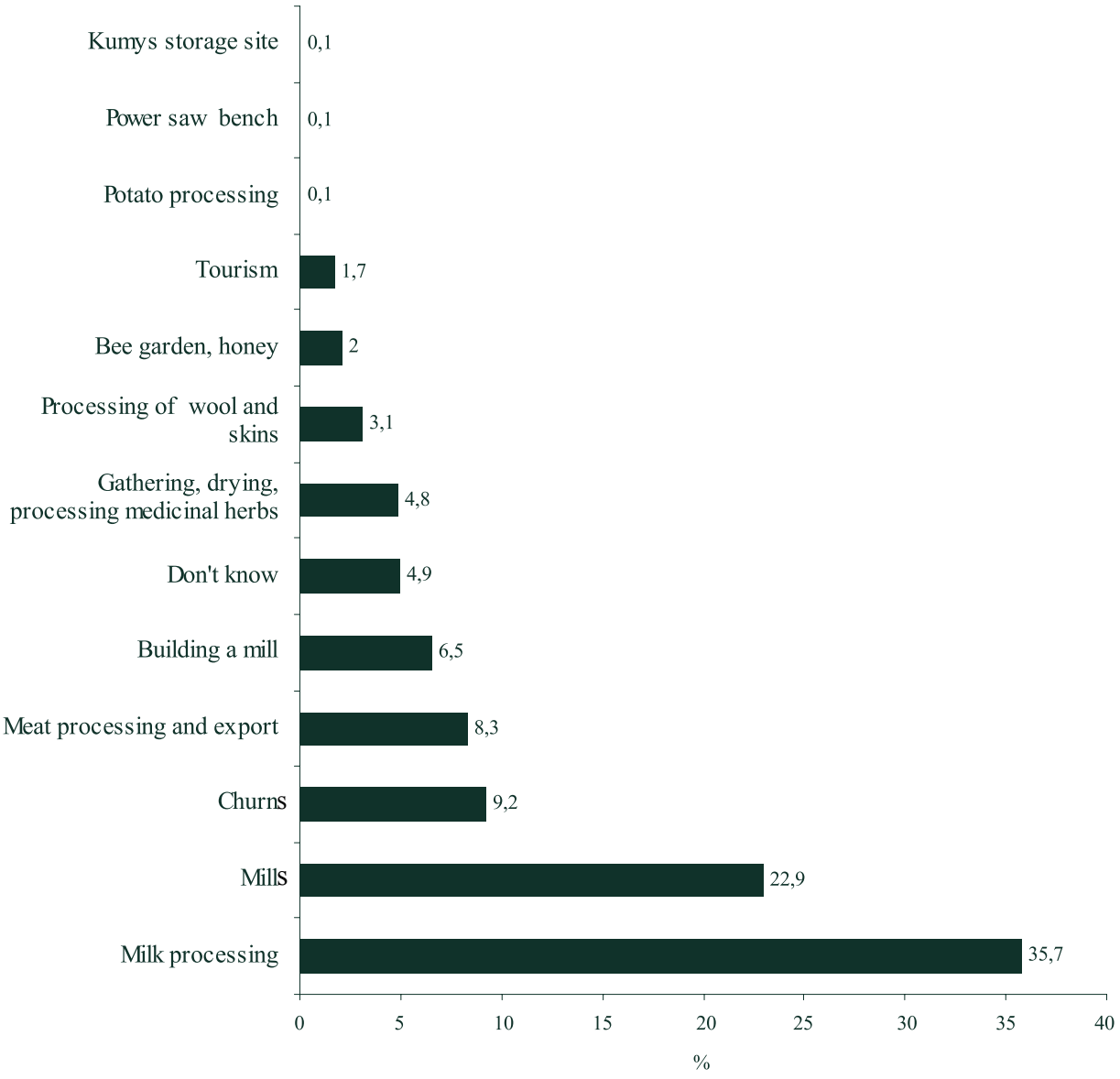
Figure 8.2. Types of Support needed to Develop Yak Breeding



Developing yak breeding requires financial /credit lines that could fund purchases and rearing of livestock and most importantly, yaks themselves. An important role lies in educating people and disseminating information about caring for these animals.

As regards camel breeding, people do not consider it to be a promising activity. While about half of respondents were ready to start yak breeding, only 16% of respondents would go into camel breeding (with full material and other kinds of support).

Figure 7.3. How to Make the Suusamyr Valley Flourish



In order for the Suusamyr valley to flourish economically it is important to develop milk processing, build mini production units, churns and meat processing facilities, build stores for kymyz and mare's milk, set up a workshop for gathering and processing medicinal herbs etc. but more importantly, it is crucial to overcome the isolated position of Suusamyr producers.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- The hypothesis that the Suusamyr Valley pastures were being degraded was not confirmed,
- Yak breeding is considered promising for the valley,
- Camel breeding is not considered promising in the valley,
- The Suusamyr Valley has good potential for developing meat production and exports.

Recommendations

- Available financial resources - including foreign funds – should be aimed not at regenerating pastures, but at developing the processing and marketing of produce;
- Legalise roadside traders by focusing on the environmental sustainability of their activities (roadside pastures, flood plains, waste collection, toilets);
- Legalise Bishkek- Osh road drivers by focusing on environmental sustainability (prohibit car oil and other waste discharges);
- For the purpose of implementing Government Resolution #360, review arrangements for controlling, distributing and supervising pasture rents and collecting and using pasture rents and creating mechanisms to enforcement the Resolution by providing funding (transport costs);
- Motivate people to use remote pastures (taking into account the time of the year);
- Create mechanisms for implementing legislation concerning unifying land plots into peasant farms and creating of associations (mechanisms to protect property and conditions for leaving the association and fair distribution of revenue taking into account contributions);
- Develop the Suusamyr Valley's export potential (sheep/goats, cattle, yaks, dairy products, mare's milk and kymyz) and ways of rearing high-yielding livestock breeds;
- Create conditions for livestock farming (support services, marketing, credit);
- Develop community-based pasture management to enhance control and responsibility over the use of Suusamyr Valley pastures;
- Introduce a scientifically justified regime for using Suusamyr Valley pastures;
- Reconstruct artesian wells to improve access to clean drinking water;
- Supply pasture users with waste containers and create special waste dumps;
- For the purpose of preserving flood plain forests, consider providing people with cheaper coal and motivate people to plant special forests to be used in future for heating purposes;
- Set up pasture users associations;
- Elaborate a mechanism and create legal conditions for long-term pasture rental, make it possible for houses to be built for shepherds on remote pastures to improve their living conditions;
- For the purpose of developing yak breeding, set up breeding farms and credit lines to support the purchase and rearing of yaks;
- For the purpose of developing and improving the Suusamyr Valley economy, build mini milk processing units, churns, sausage-making units, build storage facilities for mare's milk, build a factory /workshop for collecting and processing medicinal and other herbs.
- Create a system that will help overcome the isolated position of Suusamyr producers (purchasing companies, transport of produce etc.). Some of the ways include establishing contacts with the Business Associations of Kyrgyzstan, Kazakhstan, Uzbekistan and other countries and organising trade fairs of local products.
- To study the issue of and help offset up Pasture Users Asociations