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**CRITERIA AND INDICATORS
FOR SUSTAINABLE MANAGEMENT
OF JUNIPER FORESTS IN SOUTH-KYRGYZSTAN**

February 2004



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Front cover : fuelwood collection in a Juniper forest of South Kyrgyzstan (photo. Irina Yunusova, 2003)

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FOREWORDS

The worldwide debate in favour of the protection and conservation of forests - promoted by the Earth Summit in 1992 - has globally resulted in an ongoing effort to define and promote Sustainable Forest Management (SFM). Many discussions led to the establishment of international declarations committing the signatory countries to a number of requirements that are believed to be conductive to SFM.

Kyrgyzstan has played an active role in this international dialogue on forests and has already translated some of the guidelines into concrete changes in the forest policy at national level (I. Yunusova, 1999).

These objectives and declarations promoting SFM need now to be applied at field level. This is the goal of the Integrated Management Plans (IMPs) to define the technical processes and fix procedures to be carried out for improving the situation. In the Juniper forests of South Kyrgyzstan, this challenge is strongly supported by the State Forest Service and the European Community, through the JUMP Project.

The establishment of such IMPs needs to be rigorously conducted.

Especially a first step in the process consists in the set up of a list of criteria and indicators (C & I) defining more concretely what is SFM. This exercise has to take into account the local ecological and socio-economic situations, at a broader level than the sole forest stands and through a communicative approach basing on the main stakeholders' problems and demands.

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INTRODUCTION

C & I : A BASIC TOOL FOR DEFINING SFM

The forested area of the Kyrgyz Republic is not large but it is considered to have a key environmental role in the whole Central Asian region. Mainly located in mountains, forests ensure the protection of soils against erosion, prevent infrastructures and human settlements from landslides and contribute to the regulation of watersheds. At the same time, they directly provide timber and firewood as well as non-timber products, which play a central role in forest communities' life. Though being indirect, the importance of mountain forests for rural activities, mainly grazing, and for those related to tourism and recreation, is quite considerable.

The issues addressed by managing mountain forests do not differ from those related to any other kind of forests, but the low profitability of timber production along with the extreme vulnerability of mountain ecosystems make forest management more complex in mountains and often require specific and imperative measures. Plans need to be established to lead management in a sustainable way and it is believed that to be effective, they have to integrate the expectations of all stakeholders regarding forest management, beginning with those people who have the largest interests in forests.

Forest management requires rational approaches and technical analysis to understand the factors affecting the ecosystems' balance and to find out adapted measures to stop the depletion or degradation of natural resources. However, former experiences in this field tend to prove that Sustainable Forest Management (SFM) is impossible without ensuring sustainable social conditions for those people living in and around forests. A decrease of the life level of forest communities, sooner or later, leads to anarchic uses of forests and depletion of natural resources. There is a need to take into account social demands into forest management, from all the different groups of interests, and to balance social and environmental functions of forests together with economic aspects. Furthermore, a stronger involvement of actors in management decision processes helps further implementation and raises awareness of environmental issues.

As "Integrated" Management Plans are required, the concern is to know how to establish such plans. Former methods with one decider seem straightforward

compared to this integrated approach. In the latter one, there is no disconnection between experts' diagnostic and decision. Foresters -responsible for the implementation of forest management- are in charge of analysing the factors affecting natural resources and deciding on what to do. They have their own views, so that forest management is often biased and sometimes tends to disregard ecological and social aspects to focus on economic considerations.

In the former one, the purpose is to balance all stakeholders' interests without breaking the boundaries of natural resources that would lead to forests' depletion. It requires both the technical approach that used to be done and a communicative approach to draw decisions from the confrontation between all stakeholders. Though this laudable principle of negotiation is widely agreed, its implementation remains far from easy. When it comes down to it, oppositions of views and interests slow down the decision making process and make it more complex. There is a need for communicative tools to promote a common definition, implementation and follow-up of forest management, so that management results from the balance between stakeholders' expectations along with diagnostics from experts.

Such communicative tools have been developed at international level, in the form of Criteria and Indicators (C&I), in an effort to establish a common vision of sustainable management. They help to split this general concept into performance measurements, stating the main aspects or components of forests that are believed to be conducive to sustainable management. They can provide recommendations on the course of actions that should be undertaken, we talk about indicators of processes, or set standards on which to compare the results of management, we talk about indicators of results.

International experience has proved that C&I are very useful tools as they provide a framework to break down a general principle into concrete requirements. Whilst everybody agrees on the importance of SFM, its concrete implementation is often subject to disagreements. C&I are in fact the real objects of negotiation between interest groups. They help to draw from different and sometimes opposed views, a shared practical understanding of SFM is or may be. C&I also raise people's awareness of environmental issues and the commitment of politics to SFM. They provide a useful mechanism for reporting on the state and trend of forests, and are a means of communication at international as well as local level. However, if the use of C&I is considered to have been worthwhile at international level, a major challenge is to adapt this framework at local level and eventually implement SFM.

CHAPTER 1

A CONCEPTUAL FRAMEWORK FOR GUIDING FOREST MANAGEMENT DECISION

1.1. The assessment of Sustainable Forest Management (SFM)

a) Definition of a new concept

Conventional forest management

Forest resources have been used through time to fulfil the needs of forest communities, such as the need for firewood or for a place where to hunt. As long as human pressures remained low, natural resources were considered as endless and nobody cared about them. But when the increasing uses of forests began to lead to a significant depletion of resources, repressive rules have been established in most cases to protect forests. Representatives of legal authority were in charge of managing forests in such a way that production was maintained overtime.

In such a framework, foresters were technical and juridical experts in charge of managing forests according to the law and policy goals. They were the specialists required to analyse the constraints affecting production and to understand the natural boundaries to be respected in order to ensure a sustained yield. But apart from that, they generally paid no attention to other roles of forests and were often in confrontation with local people, who, legally or illegally, used forest resources for domestic purposes. In many cases, the local pressure pushed up the establishment of special rights, partly because an effective control of human activities into forests was hardly possible, but also because forest resources in the final analysis were vital for rural people.

During the last decades, new policies taking into consideration the expectations of public regarding environment have gradually brought foresters to consider all the benefits of forest as a whole (economical as well as non-economical), and urge them to widen their fields of competencies, including new considerations

such as ecological or social aspects. However, in most of the cases, foresters are still alone in charge of analysing the environmental issues and deciding on what to do. There is no disconnection between the expertise of natural constraints and decisions, which brings an obvious bias in the result of the decisions. Even if foresters are more able to understand the competing uses of forests than before, there is still only one decider.

This conventional decision process is underpinned by valuable principles. Forest is a complex and fragile ecosystem which management requires a strong technical background. Appraisals from specialists are necessary to decide on what to do and how to manage forest. They establish the boundaries of natural resources regarding to their use. But should management plans be based only on expertise?

A need for changing forest management approach

Over the last decades, an increasing awareness of the environmental issues and a rising will of all stakeholders to be involved in the decision making process concerning the management of natural resources have brought some major changes in this conventional approach. The debate began at international level and globally, has resulted in an ongoing effort to establish a common understanding of what SFM means.

This major concern has broadened to cover the full range of goods and services provided by forests. Sustainable management does not focus any longer on sustained yield but on the sustainability of the entire forest ecosystem. It takes into account environmental issues -which have widely been pointed out by NGOs- and social considerations. Indeed, forests are the living place of many people all over the world and provide numerous benefits of great utility to the society. They contribute to the production of timber together with a serie of non-wood products; they also ensure some major ecological and social functions.

These non-economical benefits from forests are even more important in the case of mountain forests with heavy natural constraints and very low profitability. They contribute to the protection of soils against erosion, prevent infrastructures and human settlements from natural disasters and play a significant role in watershed regulation. Forests are also a place for breeding cattle or harvesting firewood. Besides their landscape and cultural values, they enhance the development of tourism that can play an important role in the local economy.

A new concept of Sustainable Forest Management

The concept of sustainability was first placed on the international agenda by the Brundtland report in 1987, which defined sustainable development as “meeting the requirements of present generations without compromising the ability of future generations to meet their own needs”. Although this laudable ethical principle was widely agreed, it has been interpreted in so many ways that its practical usefulness has been considerably reduced. The Earth Summit in Rio, in 1992, promoted the establishment of a common definition of sustainable management and since, a number of countries and organisations have been endeavouring to develop a shared comprehension of this concept and to devise practical tools for its implementation.

Even if there are still some strong conceptual differences about what sustainable management means, a new trend has been initiated at international level to reconsider the way natural resources are managed and the way decisions regarding the management of natural resources are taken.

As a matter of fact, the actual trend to define and implement SFM has not resulted in a common understanding of the concept and the tools to implement it. There is no a unique definition of SFM, but what is widely agreed, is that these definitions should reflect the goals and outcomes negotiated between those with legitimate interests in forests. In that sense the conclusions of negotiations become a working definition of SFM, as long as these negotiations have fairly balanced the expectations of all stakeholders. There are likely to be few absolute requirements for SFM, with exceptions being avoidance of irreversible degradations of natural resources. But there will always be the need to balance social, environmental and economical values.

Even if there is no shared understanding of what SFM means and implies, some features of this concept can be distinguished. Firstly, the definition of sustainable management results from an ongoing process, which means that the concept is evolving. From economical considerations it has been moving to put the stress on ecological and social aspects of forests and the concept is still evolving. Secondly, the practical understanding of SFM results from the confrontation of all groups with legitimate interests.

Since the early 90s, NGOs have warned the world on the general depletion of natural resources coming from overexploitation and the increasing pollution caused by human activities and leading to worrying climate changes. They have brought the international community to strongly consider these issues, which explains the importance devoted to environment in the international declarations for SFM – four out of the six criteria in the declaration of Helsinki are devoted

to environmental aspects. Gradually, the increasing concern on socio-economic aspects of forests tends to prove that the international debate is moving away from a rather strict environmental point of view to think of people responsibilisation regarding forests use as a first requirement for sustainable management. The rising number of social indicators in international declarations points out this trend for SFM. Natural resources are not protected only for themselves, but also to ensure the well being of all people who have interests. The concrete implementation of SFM is likely to be similar, but this evolution of approaches devotes a greater importance to the actors of sustainable management – human beings – than to the object of sustainable management – forests.

As a consequence, forest management should not only ensure the conservation of resources, but also be conducted in such a way that it takes into account the needs of the different interest groups. Thus, to consider these social expectations is a prerequisite of sustainability, even if the balancing of different and sometimes opposite interests represents a major challenge. These negotiations require the development of new effective communicative processes and are likely to take more time and effort than the traditional authoritative decision making. Nevertheless, it is believed that nothing else can lead to the sustainable management of forests, in the sense it is understood today. This integrated approach of forest management requires adequate technical information and support from experts. But expertise and science serve the interests of the beneficiaries, instead of determining what these interests should be. The decisions regarding SFM should be framed by experts to avoid a depletion of natural resources, but not be led by experts.

While the international dialogue on forests has been pushing through the establishment of a shared understanding of sustainable management, there is a need to develop some tools in order to precise and to implement the concept.

b) Towards the implementation of Sustainable Forest Management

Criteria and Indicators (C&I): a tool for supporting

The various actions undertaken to promote SFM over the last decade have in common to be based on a set of Criteria and Indicators. It is a legacy of the Earth Summit in 1992 where the signatory countries have committed themselves to develop sound criteria and guidelines for the management of all types of forests. The Pan European experience in this field has shown that they were useful tools, and so far, not less than nine international processes have been developed to establish C&I for SFM.

There are numerous definitions of C&I, depending on the organisation or international process considered. It results that the definition of criteria is generally shared by all, when indicators are more subject to different interpretations. As for the present study the following definitions are used. Criteria characterise the essential aspects or sets of conditions and processes by which sustainable forest management may be assessed, while indicators show changes overtime for each criterion and demonstrate the progress made towards its objective (MCPFE, 1998). It should be stressed that an indicator is not a sub-part of a criterion. Although each indicator is usually classified under one criterion, it often provides information to several criteria at the same time. For instance, the indicator concerning the area of forest is usually ranked under environmental criteria, but is also relevant for economic or social concerns.

Even if there are some major challenges in the application of C&I to promote SFM, it is normally agreed that the use of C&I suits for several main reasons :

- They provide a framework that helps to define SFM. C&I provide a tool to break down a general concept widely admitted into concrete requirements, which may be more subject to disagreements.
- They are a means of negotiation, an object of confrontation between interest groups.
- They raise the awareness of the public in general and the commitment of politicians to SFM.
- They provide a useful mechanism for reporting on the state and trend of the forests by comparison against norms and expectations.
- They are a means of communication at international as well as local levels. Such information can be important to gain community and political support for forestry activities.

C&I are first of all a means to formulate the needs of the interested groups – tied with ecological constraints – which gives way to negotiations and thus to management decision making. Then, but only then, the indicators can help in assessing the performance of the project overtime and possibly redefine objectives basing on previous results. In addition, indicators may be a useful means to keep stakeholders informed of the course of the situation.

Indicators of results versus indicators of processes

Different classifications of C&I exist with their advantages and weaknesses, but a feature that emerges when handling indicators is that they can be used in two different and complementary ways. On the one hand, the performance standards approach aims at assessing results against standards. Indicators of results do not provide direct recommendations on actions to undertake, but rather follow

overtime the changes of certain components of forests -which can be compared with the expected results and urge managers to take decision. For instance, the indicator stating “the area and percentage of forests and their change overtime” just reports on the evolution of forested area without providing means to stop or change it, but is considered as a useful information to guide forest management. In this case, indicators are generally quantitative and measure performance by comparing results versus objectives.

On the other hand, a more procedural management approach aims at assessing systems. It does not focus on the results of action but rather on the process, which from the starting point leads to the results. Such indicators can be expressed as recommendations on the way management should be conducted. For instance, the indicator “develop community consultation and information tools” urge managers to take measures in that way, but does not precise the expected outcomes or even how results will be measured. It is to be linked with indicators of results. Indicators of processes are mainly qualitative and therefore, often more complex to master. But they may be directly used for management decision making.

Both approaches are required to handle a project. The assessment of results is a useful and rather simple way to follow-up performance overtime, while the assessment of processes compels continuous improvement and is particularly required for building-up new management plans.

A question of scaling

A key challenge lies in the adaptation of C&I that have generally been developed at international level (to raise awareness and gain political commitment) to the finer levels. Previous experiences proved that this adaptation is far from easy, as the concrete concerns of local managers are often different from the global issues addressed by the international community. This step of the process is crucial, for it is to legitimate the international effort to SFM. What would be the good of the commitment of many countries to follow international principles, if the experience proves that these declarations are useless when they come down to practice?

The first concern is to define at which finest scale it is still possible to talk about sustainable management. It is the so-called Forest Management Unit (FMU) : the smallest area of forest for which sustainable management is still meaningful. It is clear that not all management decisions should be taken at this level. As an example the questions of landscape or watersheds regulation have to be answered at a larger scale than the FMU. Not all decisions are to be made at the same scaling.

A key word in Sustainable Forest Management is management. This means that only the responsible actor, the forest manager himself, can guarantee the sustainable management of the forests he is in charge of. It is meaningless to say that just a piece of this “one-person management unit” is managed in a sustainable or unsustainable way. The result of the management should be considered on the whole area controlled by the manager. This definition has to be adapted according to the local organisation in charge of managing the forests. It is unlikely that just a unique definition exists. A finer scale at which sustainable management is still meaningful is the area managed by no more than one actor, but all that area.

Once the concept of FMU defined, the aggregation of some of them gives the larger levels of management. Indicators are to be declined related to the level of scale considered. An indicator may be useless at some scale whilst being relevant at another one. Thus, when handling an indicator, it should always be stated at which scale it is considered.

Some major challenges to overcome

As formally experienced, SFM has no pre-existing definition, but should result from the negotiations between the various groups having interests in forests. A democratic approach is required, as it legitimates decisions, helps implementation and raises awareness. However, experience has proved that when it comes down to concrete tasks and commitments, the confrontation of interests between stakeholders and ecological constraints as well make negotiations difficult and put a curb on implementation. The use of C&I, as a set of rules reflecting the various and sometimes opposite needs of the different stakeholders and committing decision makers, has proved to be helpful in this process. But whilst the broad rational underpinning C&I seems straightforward, it becomes a major challenge to define finer indicators requiring stronger commitment.

It seems that the lack of precision is part of the system and may even be a necessary condition. It comes from the caution adopted by all the groups involved, who prefer at first to push up their demands to be able to negotiate them down afterwards. This fuzziness gives way to further adjustments, but limits commitment and slows down implementation. There is a need for an effective method, involving all stakeholders and consistent with the international C&I for SFM, to define at finer scales how to put into practice SFM.

1.2. Methodology for building-up C&I for management plans

a) A conceptual framework : the mixed-model

Public decisions result from the various pressures from stakeholders, so that administrative bodies need to use both communicative and rationalist procedures to propose public financing to policy makers. A conceptual framework called the “mixed model”, developing effective processes aiming at a more flexible strategy for decision making and linking these two theoretical approaches, was developed by Buttoud & Yunusova in 2001 on the case of Kyrgyzstan. Its main feature is to involve all stakeholders at each step of the process for defining and implementing new decisions, and this brings into procedures and institutions a complete bottom-up approach.

The mixed model includes the following steps, all conducted in a participatory way: concerted analysis of the current situation, formulation and structuring of objectives, identification of means and implementation of the project, follow-up and evaluation (cf. Fig.1).

b) Adaptation to build-up a system of C&I

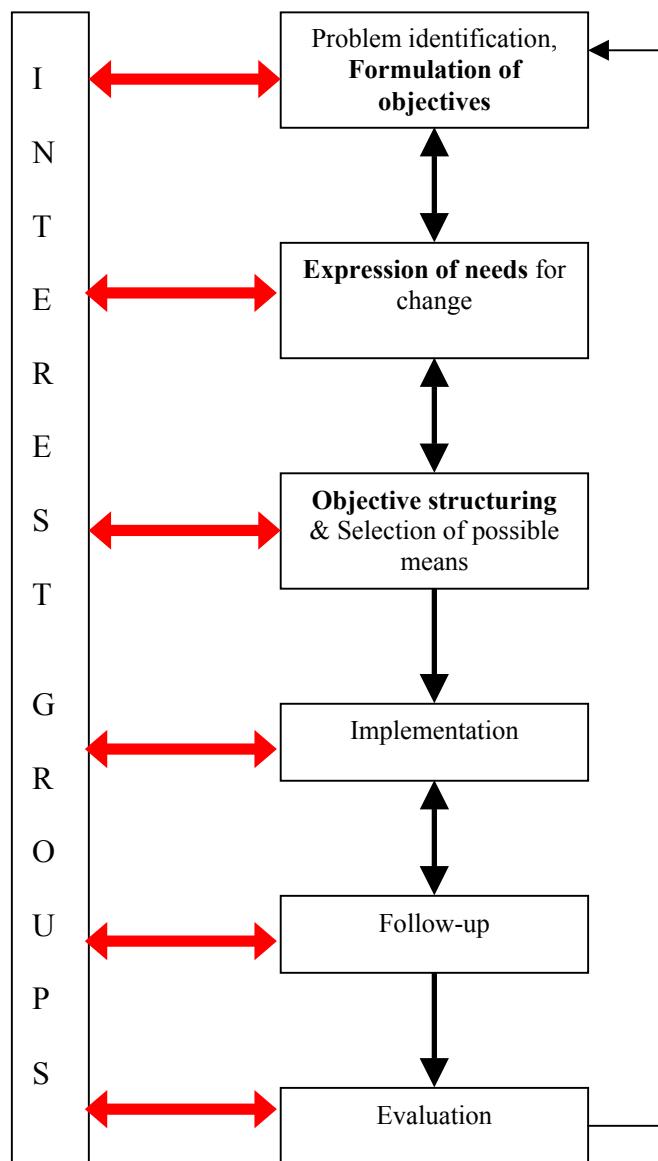
In the context of building-up C&I a similar approach is defined, drawn from this theoretical model. It considers only the first part of the mixed model; it means the formulation and structuring of objectives by all interest groups. The implementation and follow-up of SFM in the case of Juniper forests in Kyrgyzstan is to be carried out according to the same philosophy, by involving all stakeholders, but the present study only focuses on the first stages of the beginning process.

There are numerous stakeholders for this project, at local, national and international level, and the main concern is to establish a fair method, so that all of them can take part to the decision making process. The way the project is conducted should be the result of negotiations between all interest groups, but in practice it seems almost impossible to achieve this goal. When it comes down to it, there are to be unavoidable flaws and discrepancies between model and reality, but the present method aims at sticking as well as possible to the conceptual framework.

Figure n°2 presents the methodology used for building-up a system of C&I in the case of South Kyrgyzstan. It is directly drawn from the mixed model; sharing stakeholders between the local level (the people living in and around

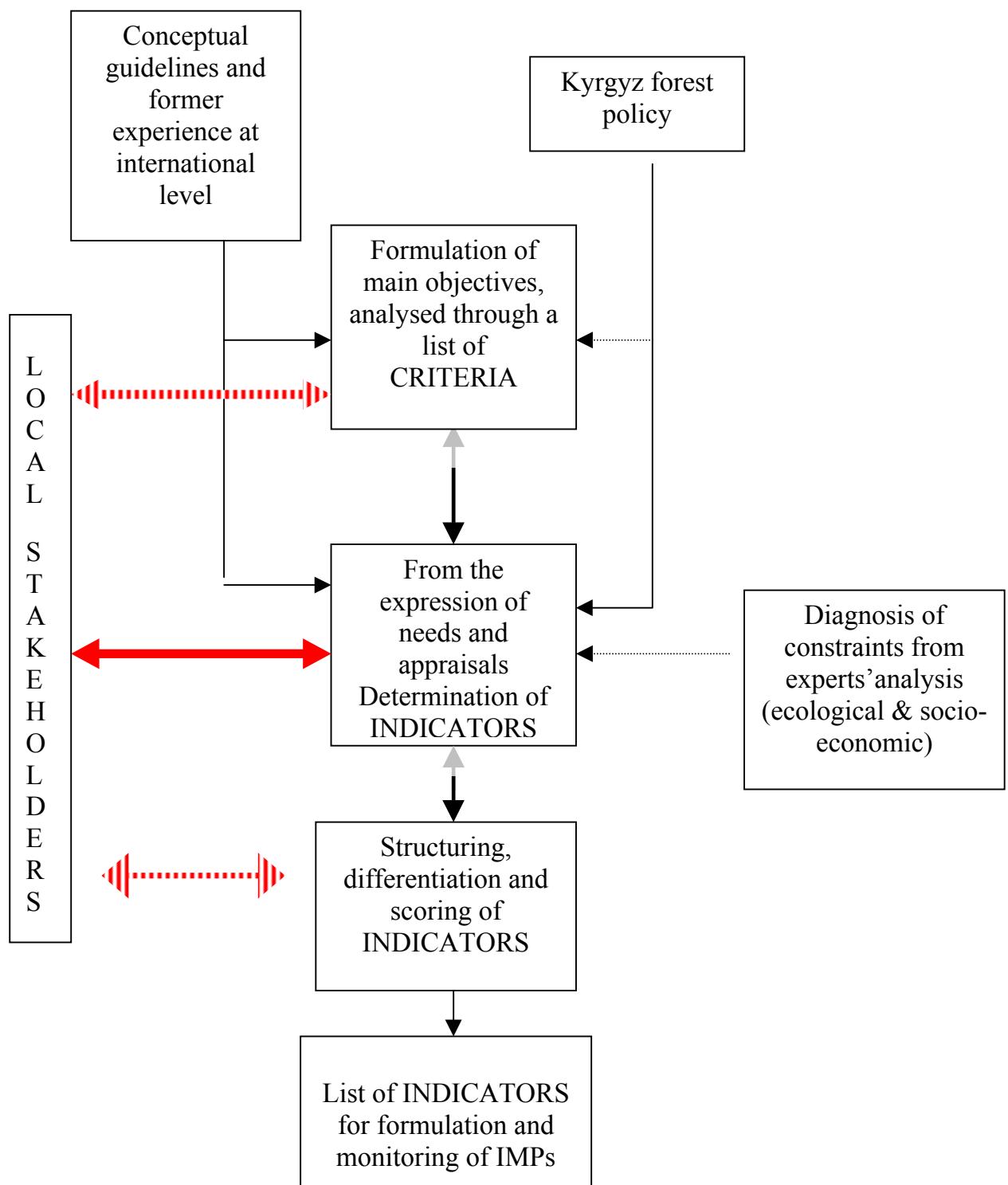
forests), the national level with the Kyrgyz forest policy and the international level with the general debate and declarations on SFM.

Figure n° 1
The mixed model



(from Buttoud & Yunusova, 2001)

Figure n° 2
Approach for building-up C&I in the Juniper forests in South Kyrgyzstan



To be consistent with the world-wide debate on SFM, the establishment of an IMP has to fit with the international framework and follow the common underpinning principles to define and implement SFM. It means that a system of

C&I is to be used as the main tool for conducting this project and the most relevant criteria for the international community are to be taken into account.

The formulation of criteria has already been done at international level. Around half a dozen of broad meaning essential aspects of forest have been identified, covering all the possible issues that might be encountered in forest management. One can argue that they are too fuzzy. For instance, a same indicator can often fit into several criteria. But it is precisely this vagueness which makes them universal. Experience has shown that they provide a useful framework to classify indicators between the main fields of SFM. In practice, local stakeholders are not involved at this stage (there is a dotted arrow in the diagram), but it does not mean a contradiction with the mixed model, as none of the local stakeholders' expectations is likely to not fit to one of these criteria.

The second step is to express the stakeholders' needs. The present model focuses on local stakeholders since they are considered as the main target groups of the project. The main task is to collect and turn the expectations of local people into concrete indicators. It involves to a large extent local stakeholders through questionnaires, meetings, interviews or just informal talks.

Diagnosis from experts are also of prime interest. They point out the ecological constraints and socio-economic issues that need to be considered to ensure sustainable management. It does not mean that appraisals have priority and exclude any contradictory expectations of stakeholders, but that both the needs of interest groups and the recommendations of experts have to be balanced to find out an optimal solution.

From all stakeholders' point of view a first list of indicators is established and then structured, arranged by criteria and scored. This step should also involve stakeholders to decide on which indicators to keep or to remove, which to assemble or to split into parts and to rank them in order of importance. In our case, a dotted arrow on the diagram shows that it was impossible to go back to talk with local stakeholders again, so the authors have chosen and ranked themselves indicators.

c) International dialogue and Kyrgyz forest policy

Many texts have been written on the international debate for SFM and as many conclusions have been drawn from it. Among this abundant literature, there is a need to choose the most relevant documents, those ones that have been legitimated by the commitment of many parties and that suit to the context of the project. They are mostly the international declarations on SFM.

The approach is to find out the most appropriate agreements stating the main conclusions of the international debate on SFM and to read them in the context of the study. The new Kyrgyz forest concept -consistent with the international views on SFM- is of great interest to carry out this analysis.

As these general indicators have been defined at international level, they need to be scaled down depending on the context of the study. It is necessary at this stage to clearly state the scale of space considered.

d) Involving local people into forest management

If the views of the international community on SFM are already clearly ordered in C&I, the needs and aspirations of local communities regarding forest management are to be obtained by different means.

Interviewing local people

The best way to know the expectations of rural communities regarding forest management is to go around villages and discuss with local people. By making people talk about what they do and how they live with their environment, it is possible to understand what their needs are. Interviews should be conducted in such a way that they compel people to express their own expectations regarding the future management of forests.

Interviewees are unlikely to tell at a stretch the indicators that should be considered to take into account their expectations. They have no idea of what indicators represent and how they can be conductive to SFM. They probably do not know what SFM is or have their own practical understanding of this concept. However, nobody else can express their needs regarding forest management and it belongs to the interviewer to turn these concrete demands into indicators. A number of answers are likely to fit with the C&I already established at international level, but some particular aspects will be disclosed or enhanced. They are to be used as a basis for establishing a new forest management plan.

Besides local people, forest experts and scientists should also be interviewed. They do not live on the spot, close to forests, and are not supposed to be involved in forest management in the same way as local communities. Information from them is considered as experts' diagnosis on environmental issues and management rules conductive to SFM. They are not in position to express the needs of local people.

Group or individual interviews ?

Interviews can be conducted in two different ways, with an individual alone or with a group of people. Both have their advantages and weaknesses. A one-person interview is likely to give a better knowledge of the interviewee's understanding, as there is nobody in his way and he can talk without restraint. But it requires much more time to gather information from different people.

In a group interview, official leaders or even just members with stronger personalities tend naturally to talk for the others, sometimes at the expense of the rightness of their speeches. Leaders can exert a control over the group and prevent people from telling what they think. It is likely to be the case in Kyrgyzstan, due to reminiscences of former censorship. Nevertheless, the group interview is considered as the most suitable way for this study. It suits with the traditional structure of the society where an individual is not considered for himself, but as part of the group he belongs to.

In all cases, foresters and social leaders are always the first to meet the interviewers and only then, villagers are gathered around, impeding another kind of interview. The challenge is to keep leaders away from spending time with worthless generalities and to take advantage of these discussions with local people to get the right information, keeping them talking about feasible and meaningful solutions.

Establishment of a questionnaire

As interviews are to be carried out, it is felt necessary to establish a questionnaire. The main difficulty that springs when preparing the first draft is that the expectations of local people have to be assumed to find out the right questions. A general knowledge of the environmental and socio-economic context of the region helps in distinguishing some features of the questionnaire, but it needs to be corrected and improved over interviews. Questions have been adapted to the different main publics concerned: the villagers using forest resources or the foresters working in leshozes, and aim at understanding the relationships between the interviewees and the surrounded forests (cf. annex 4). They cover successively four main aspects that form the logical frame of the approach. How people use or manage forests? What is their perception of forest resources? What are the main constraints that restrict their uses or the way they manage forests? And according to them, what should be done to improve forest management?

Beginning interviews, the most obvious questions concern the uses of forest goods and services. They depend on the needs of local communities, but also on

their perceptions of natural resources. How do they think themselves with the surrounding environment? What do they think their rights and duties are regarding the use of forests? What is the level of awareness of environmental values such as soil protection or biodiversity conservation? These questions are asked to villagers as well as to foresters. Each group has its own perception of forest resources and its own views for forest management.

These expectations regarding the uses and management of forests are bound to a number of constraints, which are of prime interest to understand the local situation. Part of these constraints are likely to come from conflicting relationships between foresters and villagers, as the latter ones use what the first ones have to preserve. Even if it remains partial, this first approach of the relationships between local stakeholders helps to understand local conflicts and to define how management plan should balance contradictory interests.

The discussion should eventually end with what the interviewees think should be done. Their propositions are likely to reflect their expectations. It is the logical conclusion of what has been said so far and the basis from where indicators are to be derived. Looking at the questionnaire, it seems obvious that no such a formal frame is followed during discussions, but it gives the interviewers the general structure and the main points they need to talk about.

e) Structuring and scoring indicators

Again, this step should theoretically involve local stakeholders, but in practice it is not possible to do so in the course of the study. The experts at the end of the study judge by themselves on the relevance of indicators, for local people as well as for foresters. The method used consists in giving two marks to each indicator, one of interest (what is the relevance of this indicator ?) and one of feasibility (how much does this indicator cost? Is it viable?). The mark of interest depends on the group of stakeholders concerned, as they are likely to rank indicators in different ways. It is then possible to make decisions in function of the target groups of the project.

Indicators of process are related to recommendations or actions to carry out during the project. A second level of indicators (verifiers) follows the course of these actions and informs on their achievement.

CHAPTER 2

IMPROVING FOREST MANAGEMENT IN THE JUNIPER FORESTS IN SOUTH KYRGYZSTAN

The Juniper forests spread over the mountains in Central Asia form an original and fragile ecosystem. It is relatively important in size and of particular interest for biodiversity conservation and rural development. However, over the past 60-70 years, forests were not considered as important for the economy of these former USSR countries and have undergone severe degradations. They have suffered from a combination of ecological and socio-economic factors, which led to a depletion of the resources (Buttoud & Yunusova, 2000).

The purpose is to answer these current issues by establishing new Integrated Management Plans for the Juniper forests. The area concerned by the project includes the most part of Juniper forests in the South of Kyrgyzstan (cf. annex n°1). It involves four leshozes (state management forest enterprises), one forest range and a national park, representing a total area of almost 650,000 ha, covered by about 100,000 ha of Juniper forests (cf. Annex n° 2).

2.1. The ecological context

Forests in Kyrgyzstan form a unified “State Forest Fund” including both forested lands and non-forested lands and representing a total area of 2.8 mill. ha. at country level. These lands covered or not with forests belong to leshozes - state forest management enterprises - and are usually intended for forestry.

A very flexible tree species

Juniper, which local name is Artcha, can grow in the most adverse conditions, at high altitudes, from 600 m up to 3,500 m. It is generally located on rocky slopes exposed to wind and heat, from extremely arid to humid conditions and in climates from relatively cold to hot. It grows mainly on Southern slopes as it is excluded from the northern slopes by other species. *Artcha* grows very slowly but is a long living species, with an average life span of 500-700 and over 2,000 years, if favourable conditions are provided. With its strong, long roots, it

stitches the slopes together and reinforces the soil, but not less than 50 years are required to form its root system.

In Kyrgyzstan, the major tree species of Juniper are *Juniperus Seravschanica* Kom. (*kara-artcha*), *Juniperus Semiglobosa* Rgl. (*saur artcha*) and *Juniperus Turkestanica* Kom. (*urjuk artcha*). It seems that *Juniperus Sabina* L. and *Juniperus Sibirica* Dshan are also present. The Juniper forests cover a total surface of 264,300 ha in the country, including 165,000 ha covered by a tree form of Artcha and 99,300 hectares covered by a crawling form, present at higher altitudes with the decrease of temperature and increase of humidity. A half of it: 136,000 hectares (including 116,000 hectares covered with the tree form and 20,000 hectares with the crawling form), is located on the arid and sub-arid slopes of the mountains in the South of the country, mainly in Osh and Batken oblasts. It constitutes the area of the study.

A fragile ecosystem

Artcha being a very low growing species, a depletion of the resource usually has a long-time impact. It is particularly vulnerable during the first period of its life, when it is growing deeper underground and leaves only a fragile and small tree on the surface. But the regeneration of Artcha has always been considered as very weak, with particularly slow young growth and a decrease of external pressures such as cattle grazing do not ensure the sustainability of Artcha forests. Data from the beginning of the XXth century, collected without significant grazing pressure, describe Juniper forests with low density. The best regeneration can be found on the higher altitudes of sub-alpine character and in the more dense stands, while regeneration on stony slopes is very difficult.

In 1974-1975 when the severe depletion of Artcha eventually pushed decisions makers to protect these forests, 18,000 ha were given to regeneration, but for both ecological and social reasons it has remained a problem. Artcha seeds are known to germ poorly and follow a cycle with good and bad years for germination. But this cycle has to be measured with the time scale of Artcha life, which means that the poor regeneration over the last 70 years could partly result from an unsuccessful stage in Artcha life.

The first efforts of artificial regeneration were made just after the Second World War in Uzgen leshoz, but plantations with *Artcha* berries failed. In the late 1950s, mechanical seed processing was started and some success in the forest plantation of *Artcha* was achieved in 1964 with experimental 12 ha. By the middle of the 1970s, there were about 800 ha planted, with an average survival rate of 54%. Looking for reforestation possibilities, leshozes have also created

mixed plantations, introducing more productive species, such as Siberian larch, birch or spruce (Buttoud & Yunusova, 2000).

A high environmental value

Often located in extreme conditions, where no other tree species can grow, *Artcha* forests represent an original ecosystem with some unique features. These forests are of particular interest for conservation of genetic pool and biodiversity of wild life. For instance, it is well known that nomads and later on scientists have already used *Artcha* for medicinal purposes, and a important potential still needs to be investigated. They also prevent soils from erosion, protecting human settlements from mudslides, and do the good part in watersheds regulation.

2.2. The historical factors

Through age, Juniper forests have always been a place for people to live. They were historically cattle-breeders, walking up and down the mountains depending on the season. The mountains, with or without forests, were first of all a place to live and keep cattle. The unique features of *Artcha* wood have brought local people to develop its use and grant it with symbolic, almost magic attributes. For instance, it was believed that a baby brought up in an *Artcha* cradle would have extraordinary powers. As it is often the only resource of wood, *Artcha* has been of crucial importance for local communities overtime, so that people have used it in many ways

A source of energy

Growing at very high altitudes, *Artcha* used to be the only energy source for the nomad shepherds before they settled down in the valleys. Since the charcoal of *Artcha* is considered to have the best energy quality, *Artcha* trees were extensively cut for charcoal production from the beginning of the century. In 1930, according to the data of the forest inventory, there were no more than 400,000 hectares of *Artcha* forests in the South of Kyrgyzstan, mainly due to charcoal production.

During the 2nd World War, *Artcha* forests have been sharply depleted. Trees were cut and transported by the rivers to be used in industry, mainly for charcoal. The harvested timber was also kept as an emergency stock. The result of such intense activity was a 43% decrease in forest area as compared to the 1930s. According to the 1954-56 inventory data, the area of *Artcha* had decreased from 406,000 ha to 214,000 ha.

In 1960, all types of felling except for sanitary ones were prohibited in the Artcha forests. But in fact, under the cover of sanitary fellings, good and healthy trees were cut as they were giving more timber. As the payment for the workers was done per cubic meter, the payments were revised. The payment was rearranged as per hectare of a really clean forest. The rules became more stringent, but at the same time, illegal cuttings have continued and became even worse in the recent years due to the energy crisis and the high prices of alternative energy sources, i.e. electricity, gas, coal (Buttoud & Yunusova, 2000).

A place for cattle to graze

During the Soviet Union period, with the centralised planning system and task distribution, Kyrgyz Republic was specialising in husbandry, especially cattle and sheep breeding. The grazing animal stock, expressed as sheep equivalents (1 goat = 1 sheep equivalent; 1 horse or cow = 5 sheep equivalents) was estimated to 2.5 million during the period from 1916 to 1941. It reached its maximum of 20 million heads in 1989. From the 1950s through into the 80s, Artcha forests were considered as pasture lands, not only because of permanent grazing in the forests, but also because the sheep and cattle seasonal transfer to the summer pastures and back was done through the forests. This meant a heavy grazing pressure on the forest pastures in spring (March-May) and in autumn (September-November).

As sheep and cattle breeding was a priority, the land of leshozes was in many cases given for long-term use as pastures. This trend increased until the 1970-80s and a considerable part of the forested lands had been allocated to cattle grazing. From the middle 60s the question of transferring the long-term use lands back was urgent, but until the mid-90s no concrete decision was taken. Due to the lack of free land, annual plantations of Artcha were made on an area of 120 hectares instead of the planned 300.

In 1976 in the whole country, there were 20 million heads of cattle on less than 9 millions of ha (in some cases with 15 cows per ha, compared to ecologically sustainable 0.8 head), it is said to have resulted in an excessive use of the lands for pastures. At the end of the 60s, in the leshozes of the Osh oblast, the foresters considered that more than 160,000 hectares were constituted of non-regenerating logging plots (mainly in Ala-Bukinsky and Aflatunsky leshozes), and this figure was still presented as being the same at the beginning of the 1980s. (Buttoud & Yunusova, 2000)

Other uses of Artcha forests

Artcha wood presents some unique features. It does not rot, gives out a pleasant odour and its core presents a beautiful pinkish-red colour. As it grows slowly, it is not valuable for the amount of timber produced, but for its technical quality. It has been used for instance in polygraphic industry and for the production of pencils, or by local people for the production of kitchen utensils as well as music instruments.

Besides wood, there is a host of non-wood forest products, such as honey, mushrooms or medicinal plants, that constitute valuable resources for local communities. Hunting can also count in rural economies. In addition to that, Artcha forests provides many services. For instance, they are known to have a good healthy effect on the human organism and have been used as a place for people to rest. Always located in mountainous areas, the beautiful and peaceful landscapes in and around forests are very attractive.

The future of Artcha forests in question

The situation has considerably changed with the collapse of USSR. In the course of privatisation, cattle belonging to kolhozes and sovkhozes were given back to farmers. But, due to huge economic difficulties, most of these animals were slaughtered and the number of sheep-equivalent sharply decreased, from 10.5 million in 1991 to 3.7 million in 1997. This drop of the grazing activity is supposed to give way to better regeneration of Artcha forests.

However, at the mean time, the tremendous changes to move away from a centralised system to a market economy, have resulted in a general disorganisation of the country and a severe diminution of the purchasing capacity. Industrial production has dropped and unemployment rate soon became alarming, causing a general impoverishment of the population. If the situation has since been improving in cities, rural areas remain very poor, particularly in the South of the country. The expensiveness and the lack of normal sources of energy (mainly coal and electricity) have pushed forest communities to use more and more firewood. The protected status of all Artcha forests does not prevent increasing felling, so that the future of these forests is questioned. On top of that, the public institutions in charge of forests are deeply lacking of means to ensure a more effective control, particularly close to borders, with foreign communities.

Even if the future of Artcha forests is mainly depending on external factors, not related to forest management, it is urgent to build-up coherent management plans aiming at ensuring a sustainable use of this natural resource.

2.3. Current economic and social issues

A weak economy, dragged down by the collapse of USSR

Agriculture and cattle breeding have traditionally been of prime importance in Kyrgyzstan. They account for about one-third of the country's production and employs between one-third and a half of the workforce. Only 7% of the land are arable and most of it needs irrigation. The major crops are grains, vegetables, fruit, cottons and tobacco.

Since the last decade, the government has gone a long way towards the privatisation of arable and haymaking lands but has seen a simultaneous drop in productivity. The closure of frontiers with the bordering countries has posed a number of problems, as the country used to be heavily dependent on imports, mainly for gas from Uzbekistan and for oil. With the collapse of USSR, the under equipped Republic has been left without the resources to survive by itself.

As a result of the emphasis on agriculture, much of the industrial sector is devoted to agro processing and accounts for about one-quarter of the production, with mining, hydroelectric power generation, food processing, electronics and textiles. But investment is low and facilities are decaying, partly because of the departing of the Russian workers -over 200,000 Russians left the country in the afterwards of the Soviet collapse.

If it has few lands for agriculture, Kyrgyzstan possesses some important mineral resources, including coal, gold and uranium. However, again due to the Soviet collapse, coal industry has been suffering a catastrophic fall in recent years – from 3.45 millions of tons in 1991 to 0.50 millions of tons in 1998 -despite intact reserves estimated to 2.9 billions of tons. It has serious repercussions on the use of other energy such as firewood. Nowadays, the inefficiency of coal mining in Kyrgyzstan makes it cheaper to buy coal from Kazakhstan.

Gold mining, with the Kyrgyz-Canadian company, represents about one third of the Republic's GDP, while uranium mining is over now, and has left contaminated water supplies. The country still has major reserves of fresh water locked up in the form of glaciers and its mountain rivers offer vast hydropower potential, though so far it only fulfils about one-quarter of its requirements. Expanded development will inevitably collide with environmental considerations.

Tightly integrated into the old soviet system, Kyrgyzstan remained in the rouble zone until 1993, too long to not be dragged down with the collapse of the Russian economy. However the introduction of the Kyrgyz som was not without

trouble, since the country has to face Uzbekistan and Kazakhstan, still then in the rouble zone. On the whole, in spite of the most liberal attitudes in Central Asia, Kyrgyzstan has one of the shakiest economies in the region. Between 1990 and 1996, industrial production fell by over 60%, dragging the economy back to the levels of the 1970s when it was one of the lowest of the USSR. Nowadays unemployment rate is high and the average monthly wage low -about 600 som, or US \$ 15.

Potential role of forest resources in the economy

The total timber stock is approximately 23.5 millions of cubic meters, but the annual amount of timber harvested does not produce more than 50,000 m³, while the country demand is about 10 times higher and is satisfied by Russia. Timber is mainly harvested in the spruce forests in the North, while forests in the South are mainly protective ones. However, given the lack of forests in Kyrgyzstan, the potential role of timber products in the economy is to remain very limited, and so far, firewood has formed the major part of the wood extracted from forests (Yunusova 1999).

On the contrary, there is a big potential for non-wood forests products, mainly honey, nuts -from walnut, pistachio-tree and almond-tree- medicinal plants, mushrooms, fruits and berries. Though, they are often not used due to the lack of the processing facilities and poor marketing. Demand for those non-wood forests products has dropped with the general diminution of the purchasing capacity. If rural people still use them, they do not play a significant role in local economies.

In addition to timber and non-timber products, forests can play a significant role in the economy of the country, mainly through tourism. Situated at the heart of the Tien Shan mountain range which reaches over 7,000 meters above sea level in place, Kyrgyzstan has a natural advantage in this area.

Social dissensions

The situation is more worrying in the Southern country, isolated from the North by a barrier both physical and political. A mountain range cuts the country in two parts and the government in Bishkek is often blamed to under-represent the three Southern provinces (Osh, Jalal-Abad and the recently created oblast of Batken). As a result, the russified northern provinces are more industrialized, though hardly 40% of the population live there, while the rest is confined in less than the 15% of the land. These North-South contradictions are often considered as a major destabilising factor within the society.

Tensions have arisen over the governmental territorial concessions to China, and gas and electricity exchange with Uzbekistan. The presence of Tajik and Uzbek enclaves in South Kyrgyzstan is also a source of conflicts.

2.4. Which stakeholders ?

A feature of the so-called Integrated Management Plan is to involve all stakeholders at each stage of the building process, so that decisions result from negotiations and not from the will of one interest groups. Such methods have never been used so far in Central Asia, as the approach for forest management during the former USSR period was pole apart from the principles underpinning IMPs.

The target groups: the local stakeholders

Previous studies in Central Asia have shown that the involvement of local users in forest management is a necessary condition to make implementation possible. Furthermore, after many years of centralised policy, there is an increasing trend for citizens' participation to public decisions in Kyrgyzstan. Thus, one of the main concerns is to involve local stakeholders in the decision making process, and hopefully, to give way to a more democratic social life.

One has to understand the tremendous change of mentalities this new approach requires. So far, all forest management plans have been established by the forest service alone, focusing mainly on wood production and later on forest conservation, but with no much consideration for social and ecological aspects. Top-down decisions followed the normal hierarchy and local people were kept away from the decision making process. The present project seeks to compel the participation of local stakeholders, these communities whose conditions of life depend directly on forest resources.

There are other stakeholders, such as the Kyrgyz government or the technical institutes taking part to the establishment of the new management plans, but the stakeholders' mapping is here voluntarily simplified to focus on the target groups, the local stakeholders. Basically, they can be split into two major groups: the foresters working in leshozes, and the villagers -non-foresters- whose most of them are farmers or shepherds. Though this vision is a broad simplification of a much more complex situation, it distinguishes the major groups of interests at local level. The relationships between these two parties, with its oppositions of interests and relations of authority, is of prime importance for establishing new management plans.

The Kyrgyz Forest Service

The Kyrgyz Forest Service (SFS), is a State administrative body in charge of the implementation of the national forest policy. It is the only representative of public authority in forestry and is considered as the owner of the IMPs. All the other participants are partners to assist the forest service in the elaboration of IMPs. The forest service will take a major part to most of the activities, being involved in the formulation of IMPs and in the management and follow-up of concrete operations in the forests.

The project of establishing IMPs is consistent with the new Kyrgyz forest policy and strategic lines, which have been elaborated since 1998. The National Forestry Concept elaborated in 1998 and the new Forest Code in 1999 are supporting great changes in forest management approaches. The headquarters of the forest service SFS have already received methodological assistance from foreign institutes and the preparation stage at top level is considered to have been successfully completed.

The forest service (SFS) is the direct beneficiary of the project. It will receive support to establish and implement IMPs. But the goal is not only to convey to the forest service the required knowledge and know-how. It is also to devise and establish a new method for building-up the forest management plans, based on an incremental process of discussion and negotiation with local stakeholders. Again, it is one of the major challenges of this project as local people and forest guards have never been used to such an approach and may be reluctant to work together.

The forest communities

Kyrgyz people were traditionally nomad shepherds before they settled down in valleys. In the Artcha zone in South Kyrgyzstan, about half of the families still have cattle and practice the dzhailoo – the summer transhumance – living in traditional yurts (large felt round tents) or simple tents. A family of shepherds owns about 5 to 10 sheep plus 1 or 2 cows and sometimes a horse or a donkey. The period on pastures lasts five or six months, until September when they bring cattle back to villages. Artcha is often the only source of wood on pastures and the only available energy, so that shepherds are deeply dependent on this resource.

Along with cattle breeding, agriculture is the main activity, though there are very few arable lands over the mountains in this region and irrigation is always required. Since the privatisation of kolhozes and sovkhozes' lands, most families have their own plots of lands where to grow vegetable or make hay to feed cattle

in winter. Agricultural works are ordinarily carried out without tractor or machine, but in a traditional way, which requires a large labour force.

However, excluding agriculture -both crops and livestock- there are few jobs in this region. Most industries are located in the North of the country whilst the South has always been under-equipped. Mining production, which used to represent a major source of revenues in the South, has dropped since the collapse of USSR. On top of that, families have often many children, about 5 or 7, which gets the demographic pressure higher.

Through times, local communities have used Artcha forests in many ways : for heating, manufacturing tools or building houses, as well as for collecting non-wood products, hunting, breeding cattle or resting. But local communities' pressure on forests depends widely on their life level, and on the whole, rural communities in the area are poor and getting poorer. Most of them are considered to live below the poverty line, being increasingly dependent on forest resources. This factor is of prime importance for the project, as it is likely to be the main constraint impeding the sustainable management of Artcha forests.

CHAPTER 3

THE BASIC INFORMATION TO DEFINE A SYSTEM OF C&I FOR SFM IN THE JUNIPER FORESTS IN SOUTH KYRGYZSTAN

3.1 The international and national definition of C&I

a) The use of the international framework and principles of SFM

The increasing awareness of environmental issues over the last decade has brought not less than 150 countries to commit themselves into nine different processes, aiming at establishing C&I underpinning SFM. A tremendous amount of work has already been done at international level, resulting in the establishment of a shared framework for defining and implementing SFM. This standard frame -a list of main C&I- is to be used in the case of the Juniper forests in South Kyrgyzstan.

The concept of SFM is commonly split into 3 main fields of sustainability :

- environmental
- economic
- social, political and institutional

These 3 major areas lead to 5 to 8 criteria, depending on the international process considered. Among these criteria, seven are widely acknowledged all over the world and can be considered as a robust framework for building-up indicators.

They are the following :

- area covered by forest and contribution to the carbon cycle
- health and vitality of forest ecosystem, capacity to regenerate naturally
- biodiversity of the forest ecosystem
- protective function of forest
- economic benefits from forest
- social aspects of forest
- policy, planning and institutional framework

Experience has shown that whilst these broad rational principles seem straightforward, a finer definition and implementation of C&I to improve SFM raises major challenges of both conceptual and practical nature. As said before, a major issue is the scaling and how to adapt C&I developed at international level to the Forest Management Unit, considered as the place where most of the decisions related to forest management are taken.

In the case of South Kyrgyzstan, the scale chosen has to fit to the existing administrative boundaries, which means the leshozes, or possibly the forest ranges (there are about 3 or 4 forest ranges by leshoze). Indeed, most of the data concerning forest management are already collected at leshozes' level and it would be too much work to bring up this level of precision. However, depending on the situation, it may be required to use finer levels of definition. For instance, villages or areas of pastures.

Not only criteria, but also some indicators defined at international level are likely to be used in the present context. A choice has to be made regarding which international indicators to pick up or not, and first of all, from which international declarations to draw indicators. Two international processes for SFM have been used in this study: the process of Helsinki and the process of Near East. The latter one is the only international declaration in matter of environment signed by Kyrgyzstan (cf annex n° 8), while the former one is the earliest and most advanced process relating to C&I.

b) The framework of the National Forest Policy for defining criteria for management practices

The whole process of formulation of the new forest policy in Kyrgyzstan has resulted in the establishment of a basic governmental statement : The Kyrgyz Forestry Concept. It directly contributes to define the strategic goals to be implemented at various levels.

The Kyrgyz Forestry Concept points out five policy goals for forestry :

- ensure the sustainable management of forests : develop new methods for harvesting over-matured forests and processing non-timber products, increase the national potential of wood production and the multiple uses of forests, link forest research with practical forestry.
- improve the management of leshozes : the economic independence of leshozes is the focus of the new forest policy as it could promote the economic rebirth of mountain regions, through creation of new jobs and poverty alleviation. Reformed management with the introduction of marketing practices should lead to economic stability.

- associate local population and stakeholders to forestry development : promote participation of local people in forest management.
- develop the link of private activities with forestry – some of the forestry activities are to be given to private hands; creation of private plantations and privatisation of timber processing workshops.
- redefine the role of the State in the forestry sector : based on the principle “less State but better State”, streamline the control and responsibility of the state, and restrict bureaucracy, excessive centralisation and ineffectiveness (Yunusova, Buttoud & Grisa, 2003).

The concept provides some elements on the way to achieve these objectives. It includes ten directive lines, directly linked with the strategic goals of the national forestry concept.

The Forest Code (promulgated in 1999), as a necessary tool to implement the new forest policy, was supposed to follow the logic and principles of the Forestry Concept in order to form a comprehensive framework for the development of the forestry sector. But, evidently, the rapid vote of a new Forest Code presented bigger immediate challenge for the forestry administration, which, through the approval of the new code, has acquired more power. The result of this precipitation is a Forest Code not always consistent with the Forestry Concept. Nevertheless, it still provides some space for flexibility in introducing changes such as the establishment of integrated management plans.

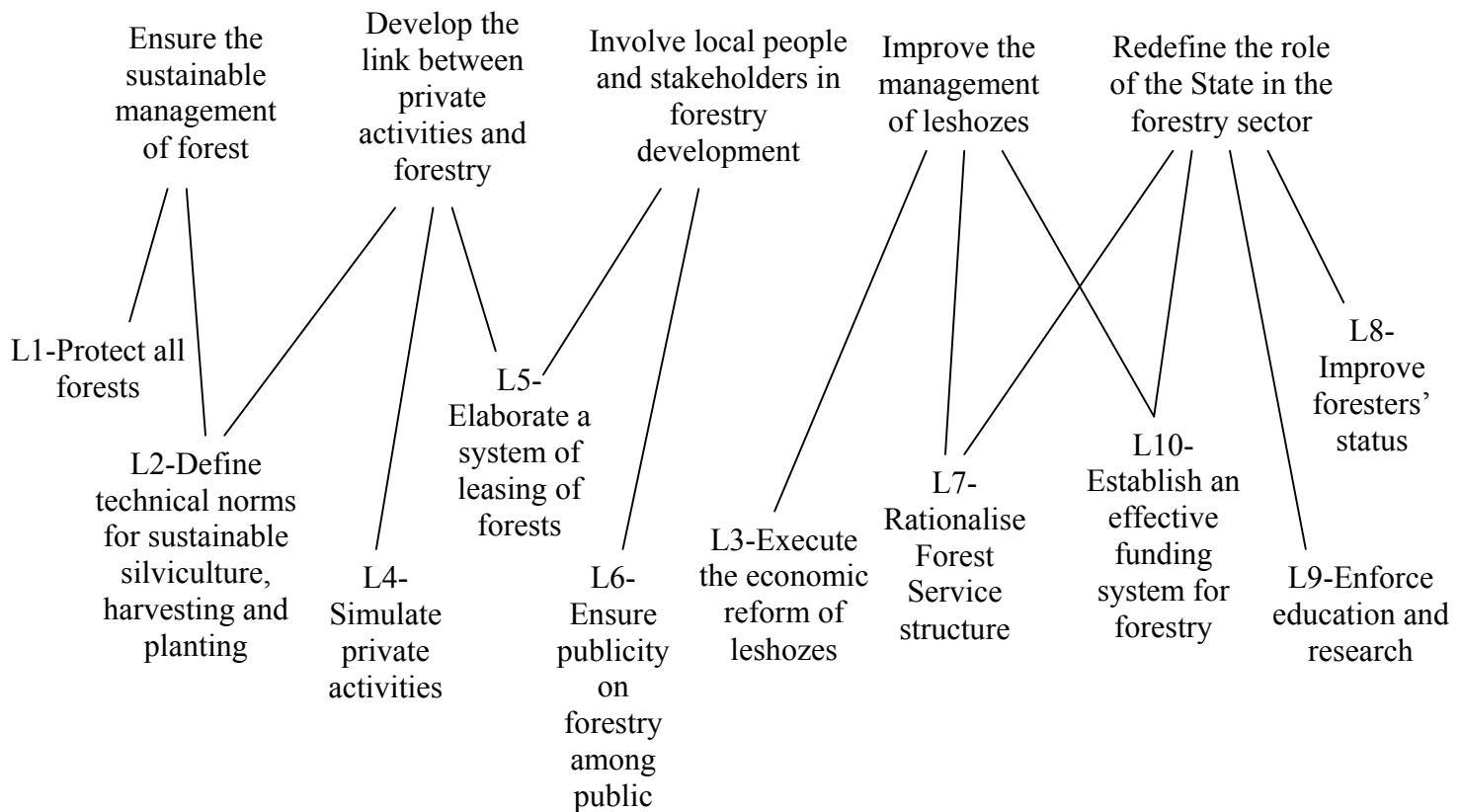
The Kyrgyz Forestry Concept is of great interest in the process of building-up management plans for Artcha forests in the country.

The following basic question should be asked: which indicators should be taken into account so that the management plans for Artcha forests are consistent with the national policy?

A good part of the indicators underpinning the forest policy of Kyrgyzstan are likely to have already been stated at international level, but some particularities of the country related to its own history are absent from world-wide declarations and expressed only at national level. They are to be taken into account for the project.

In this study a semantic approach is needed to draw, from the two international declarations for SFM and the Kyrgyz forestry policy, the relevant indicators in the context of the Juniper forests in South Kyrgyzstan. Some of them may be found useless in definitive and not taken into account, but the purpose at this stage is to consider all the possible indicators that could be relevant for building-up management plans in the context of the study.

Figure n° 3
**The links between the goals and strategic lines in the national forest policy
in Kyrgyzstan**



3.2. Communication with local actors : basing indicators on expressed local needs

a) Collecting the expression of stakeholders

Interviews with foresters and villagers

The brief socio-economic analysis of local stakeholders provided by the study is the result of a five-weeks work in South Kyrgyzstan. About 20 interviews – plus a number of informal talks – have been conducted over the whole area (annex n°1 and n°2). Three to five days by leshoze have been spent to interview both foresters and villagers (non-foresters, mainly farmers and shepherds; most of the time groups interviews, lasting one to maximum two hours).

Interviews with foresters have always been conducted in the main office of leshoze, gathering around a dozen of foresters including the director. In each

leshoze, one interview was conducted with foresters plus two to four interviews with villagers (cf annex n° 3). Discussions with villagers (non-foresters) gathered 5 to 30 people and were arranged in villages or directly on pastures where shepherds live with their families during summer. All the places visited are always located close to forests, so that most of the inhabitants use forest resources.

Though the number of interviews is rather small, it is large enough to draw faithful conclusions and recommendations for the establishment of C&I. The major socio-economic issues pointed out in this study have been expressed by local stakeholders a number of times. These repeated demands between interviews helped to find out the features of the situation.

The shortcomings of the method

A limitation in the methodology can come from the fact that foresters have always arranged themselves interviews in villages. They decided on which villages to visit and were attending local people's interviews. Their presence, and often their voluntary participation to interviews, brought an obvious bias to the information collected. However, it was not possible to proceed differently or to ask them to go away during the discussion. Local people were unlikely to give precisions about thorny problems such as illegal felling, but the presence of foresters sometimes made them tell nonsense. For instance, they sometimes ensured that the more cattle graze into forests, the best forests are, or they tell us that their relationships with foresters were all right when we knew they had a big argument the week before.

Nevertheless, it seems that villagers were not so afraid as they sometimes talked bitterly to foresters. In fact, a number of interviews in villages have resulted in arguments between local people and foresters, which proves the complication of the situation. We also witnessed such arguments between the director and the staff of leshozes. These bothering conflicts disturbed discussions, but were useful as they pointed out the most urgent problems.

Talking with foresters, another difficulty came from the fact that they tend to understand the project in the way they would like it to be. Foresters may poorly have understood the objective of the study, but they always got that money from Europe was to be spent in Kyrgyzstan and they tended to answer in order to get as much of this fund as possible. For instance, when we asked if they had problems with forest fires, the answer was always positive, with sometimes even gestures and exclamations. But when looking deeper, it could appear that there has been no fire over the last ten years and that no measures were taken to bring the risk down.

Another constraint came from the difficulty for local people to handle some simple notions such as budget planning. They plan their expenses no more than a couple of months in advance and have a poor understanding of their annual budget. For instance, when asking if they pay more for firewood or pastures taxes, they were usually confused and such questions resulted in long discussions between participants. Step by step questions were often required to find out the expected answers.

b) The results of the analysis

Factual aspects

A good part of foresters' time is spent to control human activities in forests and collect the leases for firewood, pastures or agricultural lands. Besides that, the main activities are to maintain tree-nurseries and to plant. The major species used for plantations are Artcha (the three species: *Juniperus Seravschanica*, *Juniperus Semiglobosa* and *Juniperus Turkestanica*) and spruce. Some attempts have also been made with other trees such as *Pinus Sylvestris* (in Utch-Korgon leshoze) and *Larix*. Almost all seedlings are produced by leshozes themselves and tree-nurseries are very well maintained, so that a part of the production of seedlings can be sold. Seeds are generally collected in leshozes' forests, but foresters have a poor knowledge of the cycle of seeds germination of Artcha and scarcely take into account the fact that there are good and bad years for seeds germination.

Timber harvesting is forbidden in all Artcha forests. Leshozes do not even conduct sanitary operation, as people -through illegal felling- tend to remove at first the dead or ill trees. According to foresters, Artcha grows too slowly to consider the possibility of wood or coal production in Artcha forests.

Almost nothing is done to prevent forests from fire or from the attack of pests and diseases. There is neither infrastructure to put out fire nor preventive measure to bring the risk down. For instance, haymaking is not conducted in such a way that it helps to reduce the threat of forest fires. The lack of means explains why no treatment is used against pests and diseases -when it would be worthwhile in nurseries.

Forests belong to leshozes and local people need to pay for using forest resources. For firewood, they sometimes pay an annual lump sum, or generally buy it by cubic meter. Foresters show them the plots of forests where they can collect wood and provide a receipt with the volume of firewood paid for.

On summer pastures, people use only firewood and muck from animals. There is no electricity and it would be too expensive to bring coal onto pastures. A

family uses minimum 3 to 4 m³ each season. Muck provides usually less than 10% of the needs of energy. However, when families organise cattle breeding together, just a few people remain on pastures to look after the whole cattle. They use as much as muck but less firewood, so that muck can count for half of shepherds' needs of energy.

In winter, people still use firewood even when they have coal, at least to set fire to coal. Coal is more convenient than firewood, but as it is more expensive (especially if they collect more firewood than what they pay for, which is generally the case) local people tend to use as much as firewood as possible. Depending on their needs, a family uses minimum 4 to 10 m³ of firewood by winter. Most of people use also coal in winter, from 1 to 4 tons, as it is particularly difficult to collect wood at this time of the year. These volumes of firewood should be taken for minimum. It is what local people answered, but as they generally pay for no more than 2 or 3 m³ annually, they were likely to bring down, in front of foresters, the true amount of firewood they need. Indeed, a family – let us say 9 people – which can not afford coal, requires maybe 20 or 30 m³ of firewood to heat in winter.

The price of firewood depends on the lesheze. It turns around 150 som/m³ for brushwood and 200 som/m³ for logs. It can be sometimes sold for a lump sum of about 300 som. According to local people, in terms of energy 1 ton of coal represents 4 or 5 m³ of firewood. The price of coal also depends on the place considered, and varies between 1,000 to 2,000 som/ton. Even if coal in the region mainly comes from the mines in South Kyrgyzstan, more than half of its cost is caused by transport.

Many times the lack of electricity and its expensiveness have been expressed. There are still houses not supplied with electricity, and most of the villages do not have gas. Gas is much more convenient than other energies and is cheaper than electricity to heat or cook, but people need to pay an important sum to be linked to pipelines.

There is no organisation for firewood harvesting and the control of this activity is almost impossible. Foresters know that people use more wood than what they pay for -generally around 2 m³ annually- but think that there is nothing to do to stop that. It is a main cause of conflicts, which can sometimes turn into fights. Local people are afraid to be denounced and fined by foresters, but foresters fear to be beaten. As there is no organisation for firewood harvesting, local people overuse the forests close to villages, while remote places are not exploited. A more rational organisation, by harvesting the old dead trees far from villages, could help to supply more people in firewood.

Wood for construction represents a much smaller volume than firewood. It generally comes from poplars planted on private lands everywhere on the bank of small streams. Illegal felling also provides materials for construction. The most serious cases of illegal felling are perhaps located in the forests close to borders, especially around the Uzbek and Tajik enclaves in South Kyrgyzstan. Foreign communities are out of control. After felling trees, they just come back to their own country.

There were much more cattle during USSR time. They belonged to sovkhozes and kolhozes until 1993 when they were distributed to local people, who slaughtered most of them, due to huge economic difficulties. Today cattle still represent a main source of revenues, but not all families have cattle, especially when they are just married. Local people generally consider that cattle grazing does not affect forests regeneration, except if cattle pressure is very high -which is no longer the case today.

Although the size of cattle has been increasing again over the last few years, since the plummet in 1993, shepherds generally agree that they do not lack of pastures. However, there are several places where pastures may become insufficient within a few years.

In fact, leshozes have still many unused pastures: the most remote ones with no facilities around. It is more expensive to go there, especially because roads have badly been maintained since the collapse of USSR. There can be not enough water or firewood, and on the whole, people do not want to go there. Leshozes have adjusted the taxes for pastures in function of their location and quality, but according to local people, the difference of prices is not significant. They sometimes think that all the available pastures are already used.

Families breed themselves their cattle or sometimes organise cattle grazing in common, when they have no more than a few beasts. There are two kinds of organisation, which do not involve foresters: families gather their cattle and look after it in turn on pastures or they pay shepherds. 15 to 30 families bring their cattle together to form a group of about 300 sheep or 100 cows. A shepherd costs annually 50 to 100 som/cow and 5 to 10 som/sheep. When families breed cattle in turn, the time spent on pastures is proportional with the size of their own cattle.

These common organisations have obvious advantages. They cut down the number of people living on pastures, and thus, reduce the pressure for firewood on the surrounding forests. They also help foresters to collect taxes for pastures. Rather than collecting money from a number of people, they just have to deal with the persons in charge of the whole cattle. However, such organisations are

not widely spread, for cattle breeding is often the only activity of local people. When they have no agricultural lands, they do not have a lot to do otherwise.

The taxes paid for pastures depend on the leshoze or local administration considered, as all pastures do not belong to leshozes but also to local administrations. It is about 5 to 10 som/sheep or goat, 15 to 25 som/cow and often a bit more for horses (30 to 35 som). The annual budget for using pastures is much smaller than the budget for energy, but local people claim to have the right to breed cattle for free.

There are also some herds of cattle belonging to rich people, grazing around villages. They generally use different pastures than villagers and cause no conflict. On the other hand, pastures closed to borders (again, especially around enclaves) are regularly grazed by foreign shepherds, which neither pay anything nor respect the allocation of lands to Kyrgyz shepherds.

In most of the villages visited, haymaking does not represent an issue. Leshozes do not have many lands where to make hay, but since the end of kolhozes and sovkозes, people own plots of land used for agriculture or haymaking, and manage to buy hay each other. They also take advantage of every piece of land, like road edges or between trees in orchards, so that they have enough hay to feed cattle during winter.

A sheep or a goat needs around 5 kilos of hay per day and a cow up to 30 kg. As wintertime in stables lasts around six months, people need to forecast an important amount of hay. If they do not have enough land, they need to buy hay, which can be very expensive, mainly due to the transportation costs. For instance, a family with 10 sheep and 2 cows needs 3 or 4 trucks of hay and should spend up to 8,000 som for it to compare, a sheep or a goat costs 1,500 som.

Most families manage to have their own vegetable gardens, at least to produce potatoes. If no plot of land belongs to them, or if it is unsuitable to grow vegetables, they can rent agricultural lands to leshozes or to local administrations. The minimal annual rent is 300 som/ha, but it can go up to 3,000 or 5,000 som/ha, depending on the quality of the land considered.

It can be also possible to pay in kind the rent for using agricultural land (with 30% of the production). But leshozes are more and more reluctant to be paid that way, as people tend to give them the worst part of their production.

Except around Osh and the edge of the Fergana valley, Southern Kyrgyzstan is very poor in agricultural lands. There are few places suitable for agriculture and

most of them need irrigation. Thus, local people often take advantage of every piece of land, as long as there is water around, and sometimes use forest areas as vegetable gardens to grow potatoes or plough small plots in mountains without paying any rent. It is again a cause of conflicts with foresters and so far, nothing but repressive rules have been used to stop these illegal uses.

Hunting is allowed only one or two months a year, when it is not always forbidden. Just a few people hunt and revenues from this activity remain insignificant in the local economy. Furthermore, local people have usually no weapons.

Since the collapse of USSR, honey making has been cut down. Nowadays, bee keeping scarcely represents a source of revenues, but people still consider there is a good potential for honey making. The drop of the purchasing capacity is the mean reason. It seems also that the related know-how is disappearing.

The collection of medicinal plants, mushrooms or wild berries is also limited to domestic use. All these non-wood products play no role in the local commercial economy.

Mountain forests are a place to rest for local people. The temperature is cooler in mountains during summer and everywhere calm and beautiful landscapes are worth seeing. This wonderful mountainous scenery in South Kyrgyzstan constitutes a great potential for tourism and had already been used during USSR time. Over the 90s, a small but increasing number of western tourists -mainly mountaineers- started to flow in Leilek and Batken leshozes are too remote from Osh (the main Southern town with an airport) to draw tourists. But Alay leshoze with its high summits and Nookat leshoze with its new natural park, have great resources to develop tourism.

Unfortunately, a rapt between 1999 and 2001 of foreign experts put a serious curb on the beginning sector. It seems that this event just delayed the rise in tourism as a few foreign tourists have been seen recently in the Artcha zone, for the first time for the last three years. Local people are willing to develop tourism and some consider it is the best potential to develop South Kyrgyzstan.

Apart from that, local people have sometimes granted some sites in forests with special spiritual values.

Local stakeholders' perceptions of forests

According to foresters, their main role is to ensure the protection of all forests. They spend most of their time to control human activities and the main forest

works are plantations. Tree-nurseries are permanently looked after and foresters always keep an eye on plantations. They consider that the main cause of forest depletion is the use of firewood by local people. Pressure from cattle grazing is not any longer alarming and the damage caused by forest fires or pests and diseases are, most of the time, insignificant compared to illegal felling.

On the whole, foresters consider that forests are being degraded. Even if the drop of cattle size in the early 90s has cut down overgrazing and reduced cattle pressure on forests, the sharp rise in coal price and the general diminution of the purchasing capacity have resulted in an alarming use of firewood. Forests can not produce enough wood to supply everybody. If firewood consumption carries on increasing, forested areas will inescapably decrease.

Foresters regard local people as aware of this problem, but they understand that there is a need for cheap energies and people just can not do otherwise. The situation is getting worse and will not improve as long as people can not afford other sources of energies.

All interviews have raised complaints regarding the lack of means of leshozes. But it should be recognised that foresters have hardly the minimum to carry on their work. Among the five leshozes, three have no car, and the recently created Alay leshoze owns almost nothing but a telephone. All of them need means for transportation (cars, horses), materials to conduct forest works (tractors, forest tools...) and more funds to buy seeds and pesticides, at least for tree-nurseries. Foresters' wage is also very low, about 600 or 700 som (or US \$ 15), and they are short of uniforms, weapons, binoculars... Their wages are just not sufficient to live, so that they need to have other sources of incomes. This low status leads to laziness and misuse of authority. These interviews with foresters have been the subject of a number of requests, but it seems that the need of cars is the main one. They manage to use taxi, but it is far from convenient.

Another concern is the rate of income tax imposed to leshozes. It represents between a third and a half of their revenues. When leshozes' incomes are very low like in Osh and Batken oblasts, it is particularly hard to make ends meet.

All interviews show that local communities are aware of the ecological and socio-economic roles of forests -or at least they say so. They consider themselves as dependent on forests for firewood, summer pastures in mountains and many other goods and services. They know the legal interdictions regarding the use of forests and they agree with this protected status, since a depletion of forest resources implies a decrease in their life level. In a country with so many landslides, they have often a rough understanding of the importance of forests to prevent soils from erosion and for watershed regulation.

It depends of the place considered -there are examples of former pastures where good natural regeneration of Artcha takes place- but on a whole, Kyrgyz people consider that Artcha forests are being degraded. Villagers complain that it is getting harder to collect firewood, as they need to go farther and farther from villages. They understand that the forests cannot produce enough wood to supply everybody, or at least, they think it is just enough and that there is a need to plant. Tree nurseries and plantations are almost never voluntarily damaged.

There are various causes for forest degradation, but the most important is the need of a cheap source of energy. The sharp rise in coal price since the collapse of USSR and the general diminution of the purchasing capacity, are responsible for the increasing use of firewood. There are not enough jobs and wages are very low, but people need to live. The disorganisation of the economic system is responsible for the increasing use of forest resources and nothing but providing local people with cheaper energies than firewood can give way to sustainable forest management.

Relationships between villagers and foresters

Local people and foresters have often opposite interests regarding forests. The latter ones have to protect what the former ones need to use, but on the whole, they say that they keep up good relations together. For instance, in the case of forest fire, everybody spontaneously rush with foresters to put it out. Schoolboys sometimes work for free on leshozes' plantations and local people are generally ready to help foresters. However, they all consider that their relationships have become more and more strained over the last decade.

The main reason of this worrying trend is the degradation of the economic situation on the aftermath of USSR. The collapse of the soviet system and the difficult transition to a market economy are responsible for the impoverishment of rural communities. Local communities' poverty is the main cause of all the current issues in the Artcha zone in South Kyrgyzstan. Fifteen years ago, villagers did not even look at forests for they could easily afford them coal. Nowadays, they are striving to harvest enough firewood to live. Local people poverty makes everything more difficult and foresters have often to demand from them the payment of taxes for firewood, pastures or agricultural lands. It often results in delays as people are reluctant to pay, and sometimes in conflicts. It already happened that these conflicts turned into fights between villagers and foresters.

Two vicious circles appear when analysing the socio-economic issues in South Kyrgyzstan (they are mapped on the figure below). Firewood over-harvesting and illegal felling cause the degradation of forests so that local people need to go

farther and farther from villages to harvest firewood. As there are less forests, pressure on the remaining forests increases, which speeds up forest degradation. On top of that, the high demographic growth in rural area accelerates the process of forest depletion, which leads to a decline of the life level.

The second worrying trend concerns the relationships between villagers and foresters. The poorer people are, the more reluctant they are to pay taxes to leshozes, which breeds conflicts with foresters. As a result, relationships get worse and villagers are more unwilling to pay leases to foresters.

So far, the main ways to make people pay or to prevent them from illegal uses of forests have been repressive ones. Foresters fine villagers and it is the fear of being fined that prevent people from breaking law. However, the situation differs from one leshoze to another and for instance, there has been no fine in Utch-Korgon leshoze over the last ten years.

Local people involvement in forest activities

In summer, leshozes employ around 100 or 150 seasonal workers to participate to forest works such as plantations, tree-nurseries maintenance or seeds harvesting. Given the high rate of unemployment, local people are often willing to work with foresters, but they are paid almost nothing. They receive a free meal and 10 or 15 som/day (1\$ = 42 som). The alarming lack of job urges local people to accept everything. Workers can sometimes be paid in kind, mainly in firewood or hay, but they are also ill paid. It can be a one-week or two-week work to earn just 2 m³ of firewood, which is almost nothing. If leshozes have limited budget and can not pay better seasonal workers, it is regrettable that even when they pay in kind, foresters do not pay more decent wages.

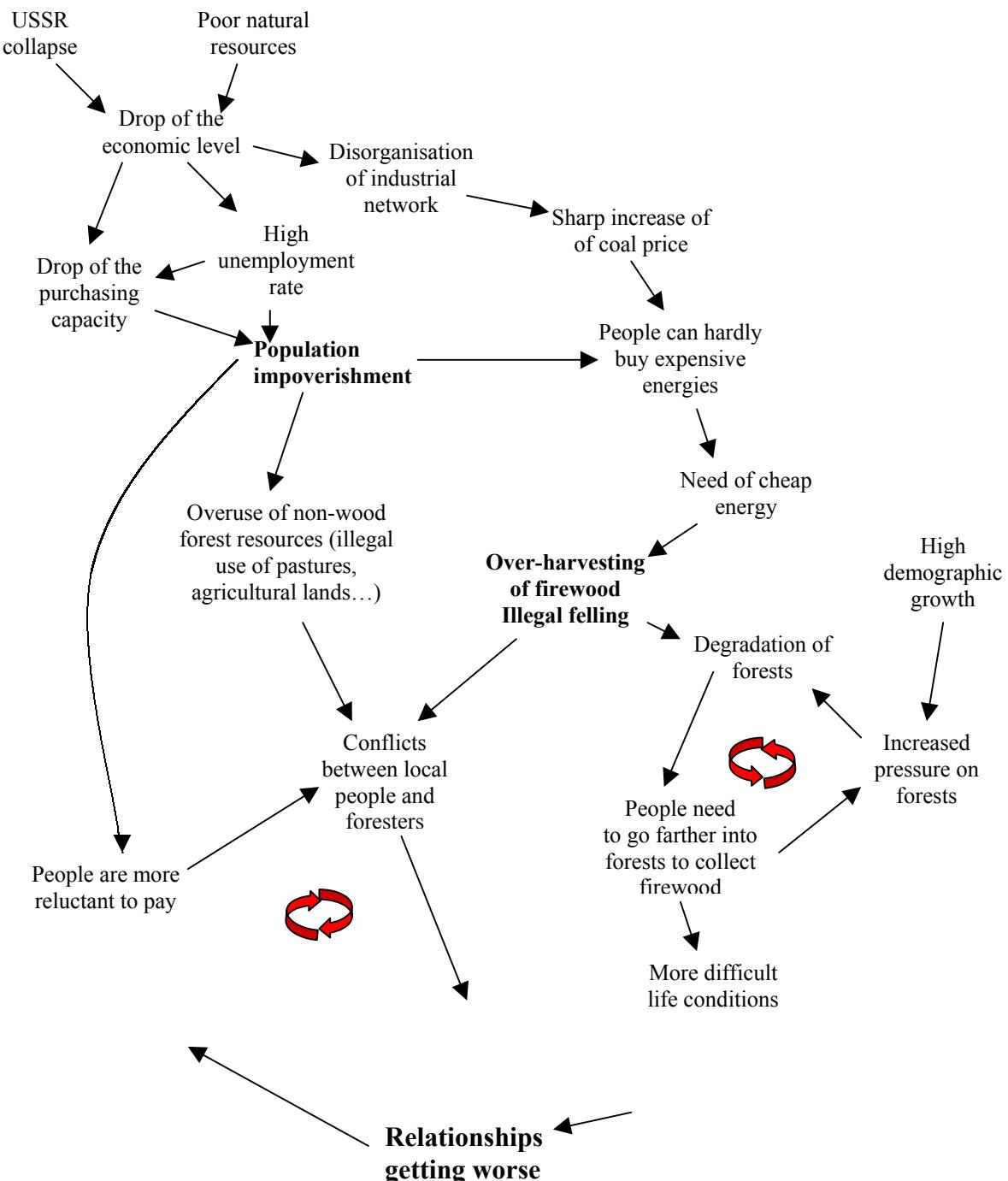
Toward local people involvement in forest management

The decision making process is still entirely led by the headquarters of the forest service and by leshozes, and local communities have just little weight in forest management -to not say nothing. It seems that both foresters and local people are not always ready to work together for the establishment and implementation of common rules. The protected status of Artcha forests, its particular fragility and very low productivity, make the involvement of non-foresters in forest decisions more complex.

Nevertheless, this analysis in South Kyrgyzstan, by questioning local people about their uses of forests resources and their expectations regarding forest management, is likely to have been the first opportunity for villagers to be involved in forest management. The directors of the five leshozes visited and

about sixty foresters spread over the South of the country took part to these discussions. By attending meetings, they generally agreed with the principle of involving local people. It is a first step toward a fairer involvement of non-foresters in forest management.

Figure n° 4
**The main socio-economic issues in the Juniper forests
in South Kyrgyzstan**



CHAPTER 4

A LIST OF C&I CONDUCTING TO SFM IN JUNIPER FORESTS IN SOUTH KYRGYZSTAN

4.1. Hypothesis for establishing IMPs

So far, the analysis has been limited to present the local context and point out the main factors responsible for the decrease of population's life level and the degradation of Artcha forests in South Kyrgyzstan. The purpose is now to give recommendations and draw possible solutions to improve the way Artcha forests are managed. Most of these recommendations do not focus on forest itself, but on the causes of its degradation. They are expressed through indicators -mainly indicators of processes- consistent with the international standards.

Almost no distinction has been made between leshozes in the following recommendations as the possible differences risen by the analysis are not relevant. However, two aspects are likely to differ from one leshoze to another and should be noticed: the potential for tourism and the existence of problems with foreign communities. These two elements come mainly from the geographical location of leshozes and not from the way they are managed.

a) Hypothesis concerning leshozes' works in forests

Improve techniques of plantations

The various leshozes are conducting trials and researches to improve plantations -try new species or develop new techniques. But there is a clear lack of communication between leshozes, so that each of them is carrying on similar works when it would be much more efficient to gather results and build-up a common organisation.

Further studies are also required to determine the cycle of Artcha for seeds germination. It is well known that there are bad and a few good years for Artcha seeds' germination, but there is a lack of scientific work on the subject. Seeds

are harvested without considering this cycle of germination, so that the use of deficient seeds is likely to be one of the factors explaining the weak success of Artcha plantations.

Precise the boundaries of the Forest Fund

No map of the Artcha zone has been done for many times. The map foresters currently used are far from exact and should be revised, or rather brand new maps should be made. Forested areas have decreased over the last few decades and many lands have changed of status, so that foresters do not always know the boundaries of the forest funds and the legal status of each plots of lands they are in charge.

b) Hypothesis to improve the uses of forest resources

Use of firewood

It has already been stressed that the main cause of Artcha forest degradation is the need of a cheap source of energy, especially for rural people to heat in winter. Due to the general drop of the purchasing capacity and the disorganisation of coal production, people have been moving away from the use of coal to firewood. Although they need to collect firewood themselves when using coal is more convenient, the expensiveness of coal compels them to use more firewood. It results that any measure to reduce the price of non-wood energies would greatly contribute to save Artcha forests from being degraded. It would also help to improve the life level of rural communities, as people would not have to endeavour any longer to harvest firewood themselves.

Improve the supply of non-wood energies

Electricity has never been suitable to heat, as it results very expensive. It is mainly used to light and cook, while coal is the traditional source of energy for heating in South Kyrgyzstan. The main concern of local people is the high price of coal. A family uses annually from 1 to 4 tons, which represents 1,500 to 7,000 som (the average monthly wage is around 600 som, or 14\$).

Fifteen years ago, coal was cheap and widely employed while firewood was mainly used on pastures -as there is no coal or electricity- and in small quantities. Nowadays, coal is still the main source of energy, especially to heat in winter, but is much more expensive. This sharp rise in price results from the collapse of USSR in the early 90s. As the domestic coal production was not sufficient to supply the whole country, Kyrgyzstan used to import part of its needs. But it has become more difficult with the closure of borders, and the

disorganisation of coal mining along with the depletion of mineral resources in the country, have caused a sharp increase in coal price.

The transportation of coal has also become an issue and counts for more than half of its price. Coal is generally carried from mines to warehouses in villages, and then villagers pay the transport to their homes. There is no organisation of transport and truck drivers work individually. Furthermore, the general bad state of roads increases transportation's costs. Measures to improve coal mining and build-up a more efficient distribution network are required. For instance, to multiply warehouses where to stock coal, so as to reduce the length of transportation. They would help to bring down the price of coal for local people, and would constitute the best guarantee to save Artcha forests.

Organise firewood harvesting

There is no common organisation for harvesting firewood. Each family harvests itself in forests the wood it needs -legally they can just gather in brushwood or deadwood as it is forbidden to fell trees or even cut alive branches. The main advantage is that it limits the price of firewood for buyers, as they themselves collect it. The sum paid annually to leshozes is just a tax for using forest resources, but does not include the cost of harvesting. However, the way rural people harvest firewood has two major downsides. Firstly, as local people always use the closest resources to their living place, pressure on forests is very badly distributed. There is no more firewood around villages and pastures, while a lot is still available in remote places. Secondly, foresters can hardly control such an activity. They evaluate the needs of local people and set a price for firewood, but villagers use more than what they pay for, which breeds many conflicts.

There is a need to organise firewood harvesting in such a way that local people can harvest the wood they need, but also that leshozes can effectively control this activity. Such an organisation is hardly possible, as there is not enough forests to fulfil the needs of the population, but depending of the local situation some improvements can be achieved. Foresters can lead the harvesting of firewood in remote forests, involving local people and paying them in kind. It can be also possible to set up a system of rotations, planning each year the forested areas where to harvest firewood.

In areas close to borders -especially around enclaves- foreign communities are responsible for great damage to forests. They are out of control and fell trees illegally in Kyrgyzstan, not only to fulfil their domestic needs but also for their own business, to sell timber back to their countries (or to Kyrgyzstan). It seems hardly possible to stop that except by closing borders, but it is clearly unfeasible

in such mountainous areas. At least, no more road into forests should be built as long as the situation is not over control. They greatly facilitate access into forests and eventually lead to the degradation of the bordering forests.

Use of pastures

The drop of cattle size after the death of kolhozes and sovkhozes has considerably decreased cattle pressure on forests. Even if cattle have been rising again over the last few years, many pastures are still not used and overgrazing is no longer considered as a main threat on forests. However, cattle breeding being a main source of revenue for rural people, a depletion of this activity has resulted in a diminution of the life level. Some measures are required to answer the current rise in cattle size and give way to an improvement of incomes in rural area.

Review the legal framework

Taxes for pastures have been set considering the location and the quality of pastures, but the differences in prices are not significant. Shepherds are reluctant to use the most remote pastures so that cattle are concentrated around villages. They complain that other pastures are not convenient (because roads have not been maintained, or because there is not enough water or the quality of grass is lower), while the small diminution of taxes -when it exists- is not compelling. Furthermore, they are willing to pay taxes at the end of the season when cattle are fatter and can be sold for a better price. A revision of the taxation system would promote a better use of pastures and help to prevent the current increase of cattle from threatening forests. Some pastures not used today could even be grazed for free.

Another subject of complaints is the lack of shelters on pastures. Shepherds traditionally live in yurts or tents during summer, but they can not always afford it. As it is also forbidden to build on pastures, they sometimes live in particularly poor conditions. It would help to provide tents or allow the building of shelters on pastures.

Promote a common organisation

The advantages of a common organisation for cattle grazing seem obvious; it cuts down the number of people living on pastures, reducing the pressure for firewood, and helps foresters to collect taxes, but nothing has been done so far to develop it. Even if leshozes are not taking part, they can promote such organisations by granting its members with special rights (use of best pastures, pay reduced taxes...). People breeding milk cows have to go daily to

marketplaces to sell their milk and should be allocated the closest pastures to village.

Haymaking

There were much more cattle before and enough hay to feed them, so there should be enough lands for haymaking today, which is the case most of the time. However, in some places, local people lack of suitable lands and have to buy hay far from their living place. Transportation raises greatly the cost of hay and can turn it very expensive for shepherds. Depending on the local situation, measures are required to extend the area of lands devoted to haymaking and help villagers by limiting the market price of hay.

Agriculture

Agriculture, along with cattle breeding, is the main activity in the area concerned by the project and plays a vital role in rural economy. It is therefore crucial to promote this sector. Significant improvements can be achieved by devoting more lands to agriculture – changes of status are required – and by developing or fixing the former irrigation system. Many rural people endeavour to grow some potatoes for domestic purpose on small plots of lands around mountains. They scarcely care on the legal status of the land they use, but maybe they should not be fined by foresters as long as they do not spoil forests.

Non-wood forest products

Although there is an interesting potential for non-wood forest products in the Artcha zone in South Kyrgyzstan, they are scarcely used for more than domestic purpose. Incentive measures would help to develop this sector. For instance, leshozes could begin with removing taxes for non-wood forest products -which do not represent any income anyway.

Recreation

In the sector of tourism as well, there is an important potential able to boost local economy in rural area. However, not all the leshozes have the same advantages in this field. The Tian Shan mountain range lining Alay leshoze forms a major attraction for mountaineers. There is already a yurt belonging to the leshoze, which works as a hotel for foreigners on a main footpath in mountains. Similar projects to develop tourism can represent important incomes, both for leshozes and for local people. The national park in Nookat leshoze draws also tourists, though they are mainly Kyrgyz and Uzbek. On the whole, the development of tourism in the Artcha zone in South Kyrgyzstan is dependent

on the accessibility of the different leshozes from the main town : Osh (the most southern Kyrgyz town with an airport). For this reason, as long as the road network remains so defective, Leilek and Batken leshozes have no chance to see tourists.

c) Hypothesis to involve local communities in forest management

Although foresters are not always ready to move away from a top-down authoritative approach to take into account local people's views regarding forest management, some improvements can be achieved towards a fairer involvement of local communities.

Promote local people involvement in forest works

The easiest way to enhance local communities' participation in forest management is to use the existing structures. Leshozes hire annually several hundreds of seasonal workers. To develop this activity is likely to raise local people's awareness of environmental issues and to urge foresters to consider the views of forest communities. Works conducted by local people along with foresters should be extended (for plantations, harvesting seeds or firewood, or maintaining nurseries). Wages of seasonal workers have to be risen, in money or in kind. It should be possible to make local people harvest firewood or make hay on leshozes' lands and pay them more decent wages with part of the harvests.

Develop community consultation and information tools

It represents a completely new approach, pole apart from what used to be done so far. In the case of South Kyrgyzstan, this method consisting of seeking advice from local stakeholders in decisions regarding forest management is just beginning. Everything still needs to be done. At this stage, leshozes can promote the creation of associations of villagers, arrange meetings of information, ensure local representatives attend leshozes' decision meetings, etc.

4.2. Final lists of indicators for SFM in Juniper forests in South Kyrgyzstan

The two following lists of C&I have been established as a conclusion of the analysis.

The first list with all the indicators of processes sums up the previous hypothesis and proposes possible actions with verifiers to follow up the course of the management plans. It is to be used for establishing IMPs in the context of the

Juniper forests in South Kyrgyzstan, with some conditions and restrictions. The actions proposed in the framework of this table are indeed very general ones, as resulting from broad discussions with experts and local stakeholders on the possible ways to develop the whole region. They may need some additional comments and adjustment before they can become concrete tools for Integrated Management Plans formulation.

The second list is the final result of the study.

It presents all the indicators drawn from local, national and international levels, that have been found relevant for building-up IMPs -including the indicators of process already mentioned. They are classified according to the international frame, using common criteria. It can be noticed that most of these C&I are directly consistent with those previously proposed in the framework of the most important SFM processes. In this regard, there is no significant difference with most of the C&I which are presented at international level. But the analysis of their possible concrete implementation basing on an assessment of the local situation leads to more precise information, especially considering the ranking of the related indicators.

Figure n° 5
List of hypothesis for establishing IMPs, in the form of indicators of process

Indicators of processes	Related actions	Verifiers	Unit
Leshozes' works in forests			
<ul style="list-style-type: none"> • Ensure leshozes are working together to improve technical norms for stable forestry (mainly for plantations) • Precise the boundaries of the Forest Fund 	<ul style="list-style-type: none"> • Leshozes produce an annual report on the results of plantations (attempts with new species, methods of plantation...) • This information is treated and communicated back to leshozes. A program of research is established • Seeds and seedlings production from leshozes' nurseries is organised in common • Artcha's seeds are collected taking into account the cycle of seeds germination • Produce maps of the Artcha zone in South Kyrgyzstan • Way mark the boundaries of the Forest Fund • Make sure all foresters know clearly which areas they are in charge of 	<ul style="list-style-type: none"> • Annual number of reports from leshozes • Annual number of reports back to leshozes • Existence of such program • Annual amount of seeds and seedlings exchanged between leshozes • Scientific results on Artcha's cycle of germination are sent to leshozes • Proportion of the Artcha zone mapped recently • Number of milestones or clear indications to mark the Forest Fund • Maps and indications are effectively communicated to foresters 	Nb report/ year Nb report/ year presence/ absence som/ year Nb communication/ year % of area Nb maps Nb milestones / leshoze

Use of forest resources			
Use of energy			
<ul style="list-style-type: none"> Bring down the prices of non-wood energies 	<ul style="list-style-type: none"> Conduct an analysis of the potential and weaknesses of coal production Take measures to improve coal mining Build-up a more efficient network for coal transportation Multiply warehouses where to stock coal Take measures to improve electric and gas supply 	<ul style="list-style-type: none"> Existence of such an analysis Amount of coal mined in Osh and Batken oblasts Proportion of coal price due to transport Number of warehouses by leshoze Electric supply/hab Price of electricity and gas Number and percentage of houses supplied with gas Evolution of the part of energy in the budget of families 	presence/ absence tons./ year % Nb/ leshoze kWh/hab som/kWh Nb/ leshoze, % %
<ul style="list-style-type: none"> Build-up a common organisation for harvesting firewood 	<ul style="list-style-type: none"> Leshozes undertake the harvest of firewood in forests remote from living places Local people taking part to firewood's harvest are paid in kind 	<ul style="list-style-type: none"> Amount of firewood harvested by foresters in each leshoze Price of firewood sold by leshoze (for logs and brushwood) Number of people taking part to firewood's harvest Salary of seasonal workers working for leshozes 	m ³ / leshoze som/ m ³ Nb people/ leshoze som/day or in kind: amount of firewood or hay

Use of pastures	<ul style="list-style-type: none"> Promote a better use of all pastures Promote common organisations for breeding cattle 	<ul style="list-style-type: none"> Review the system of taxation to promote the use of all pastures (even give them for free) Improve paths to pastures Leshozes support common organisations for breeding cattle (give best pastures, pay reduced taxes...) Allocate the closest pastures to villages to milk cows 	<ul style="list-style-type: none"> Area of pastures by leshoze Proportion of unused pastures Annual taxes for using pastures (for sheep or goats, cows and horses) Number of families breeding their cattle in common List of advantages for breeding cattle in common 	ha/ leshoze % som/ animal Nb families/ villages
Use of hay	<ul style="list-style-type: none"> Ensure an optimal use of lands for haymaking Provide help in places where haymaking is an issue 	<ul style="list-style-type: none"> Map villages or places which have not enough lands for haymaking Review the status of leshozes' lands to provide more plots of land for haymaking where necessary Review taxes to use leshozes' lands for haymaking. Allow payment in kind, with part of the harvest Take measures to limit the market price of hay 	<ul style="list-style-type: none"> Existence of such a map for each leshoze Evolution of the area devoted to haymaking by leshoze Taxes for making hay on public lands Evolution of the market price of hay 	Nb of maps ha/ leshoze som./ha som./ kg, or tons

Use of lands for agriculture <ul style="list-style-type: none"> Existence of measures to develop agriculture 	<ul style="list-style-type: none"> Review the status of public lands to allocate more lands for agriculture Do not fine local people using “illegally” leshozes’ lands for agriculture as long as they do not spoil forests Increase the area of irrigated lands (fix former installations) 	<ul style="list-style-type: none"> Evolution of the area devoted to agriculture Taxes paid to use public agricultural lands Number of people fined for using “illegally” leshozes’ lands for agriculture Evolution of the area of irrigated lands by leshoze 	ha/ leshoze som./ ha Nb of people/ leshoze/ year ha/ leshoze
Use of non-wood forest products <ul style="list-style-type: none"> Existence of measures to promote the use of non-wood forest products 	<ul style="list-style-type: none"> Remove taxes for using minor non-wood forest products Develop bee keeping 	<ul style="list-style-type: none"> These taxes are removed Evolution of the number of beekeepers 	Yes/ No Nb people/ leshoze
Use of forests for recreation <ul style="list-style-type: none"> Promote the development of tourism 	<ul style="list-style-type: none"> Develop facilities for tourism (tourist agencies, hotels or yurts in mountains, places where to rent material for mountaineers, horses, footpaths ...) Ensure security of tourists Make an inventory of forest sites with special cultural or spiritual values 	<ul style="list-style-type: none"> Leshozes’ incomes from tourism for using leshozes’ lands incomes from tourism to local economy Number of complaints from tourists Existence of a list of sites in forests with special cultural or spiritual values 	som/ tourist som Nb complaints/ year Presence/ absence

Local communities' involvement			
<ul style="list-style-type: none"> Promote local people involvement in forest works Develop community consultation and information tools 	<ul style="list-style-type: none"> Develop organisations to involve local people in forest works Ensure a decent salary, in money or in kind (mainly firewood or hay) Bring down the number of fines and the fear of villagers to be fined Promote local associations related to forests Ensure local representatives attend leshozes' decision meetings Arrange meetings to make people aware of forest issues and inform them on leshozes' works 	<ul style="list-style-type: none"> Number of seasonal workers by leshoze Number of offences to forests Average wage paid to seasonal workers Annual number of people fined by leshoze Annual amount of fines by leshoze Number of organised groups by leshoze Annual number of leshozes' decision meetings attended by non-foresters Annual number of such meetings by leshoze 	Nb people /leshoze/year Nb offences/ leshoze/year som, or in kind Nb people /leshoze/year som/ leshoze/ year Nb groups / leshoze Nb meetings/ leshoze/year. Nb meetings/ leshoze/year.

Figure n° 6
Final list of C&I for SFM in the context of the Juniper forests in South Kyrgyzstan

Marks of interest:	- no interest + medium interest ++ important interest	Marks of feasibility : 0 no feasible 1 feasible but not already existing 2 already existing or easy to measure
Indicators of process : P		

Criteria	Indicators	Stakeholders concerned and level of interest		Feasi-bility
		Villagers	Foresters	
Area covered by forest	<ul style="list-style-type: none"> • Area and percentage of forests and other wooded lands (including plantations and orchards) and their change overtime (deforestation, reforestation, conversion) • Area and percentage of forests for which management plans are made. • Area transferred in long-term use • Standing volume • Age and structure 	+	++	2
Health, vitality and integrity	<ul style="list-style-type: none"> • Area and percentage of forests affected by human activities (over-collection of firewood, illegal felling and cattle grazing) • Area of forests damaged by foreign communities • Area and percentage of forests affected by natural fires and pests & diseases • Area of forests with healthy regeneration 	+	++	1
Conservation of Biological diversity in forest area	<ul style="list-style-type: none"> • Distribution of forests ecosystem (area by type of vegetation: natural or man-made) • Areas of forests reserves and protected areas 	-	+	2
		+	+	2

Protective functions	<ul style="list-style-type: none"> Areas of forests managed for soil protection (against erosion and landslides) and for watersheds regulation Area of eroded hillsides annually rehabilitated through tree/shrub planting 	-	+	2
Productive capacity and functions	<ul style="list-style-type: none"> Annual balance between wood increment and wood harvesting (including illegal felling) and trends Amount of firewood sold by leshoze Estimation of the volume of wood illegally felled Value of non-wood forest products (honey, medicinal plants...) 	+ + - +	++ + ++ +	1 2 0 1
Maintenance and development of socio-economic functions and conditions	<p>Life level</p> <ul style="list-style-type: none"> Rate of improved livelihood of forest dependent communities Proportion of families owning cattle Average area of private lands owned by families Employment generation in the forest sector <p>Local people involvement</p> <ul style="list-style-type: none"> Promote local people involvement in forest works and in forest management Number of seasonal workers Salary paid to seasonal workers Evolution of the number of forest offences <p>Use of forest resources</p> <ul style="list-style-type: none"> Firewood annual consumption by family Coal annual consumption by family Evolution of the prices of coal, electricity and gas Existence of measures to bring down the prices of non-wood energies Evolution of the part of energy in the budget of families Build-up common organisation of firewood harvesting Price of firewood sold by leshoze (for logs and brushwood) 	++ + ++ ++ ++ + ++ - ++ ++ ++ - ++ ++ ++ ++ ++ ++ ++ - ++ ++ ++ ++ ++ ++ ++ ++	+ - - + + - ++ ++ ++ - ++ -	1 2 1 2 P 2 2 1 1 1 2 P 1 P 2

Maintenance and development of socio-economic functions and conditions	• Evolution of cattle size	+	+	1
	• Promote a better use of all pastures	+	+	P
	• Proportion of unused pastures	-	+	1
	• Taxes for using pastures (for sheep, cows and horses)	++	+	2
	• Promote common organisations of cattle grazing	-	++	P
	• Ensure an optimal use of lands for haymaking	++	-	P
		+	-	2
	• Evolution of the area devoted to haymaking by leshoze	++	-	P
	• Provide help in places where haymaking is difficult	++	+	2
	• Taxes for making hay on public lands (to leshoze and local administration)	++	-	1
	• Evolution of the market price of hay	++	-	P
	• Existence of measures to develop agriculture	++	-	2
	• Evolution of the area devoted to agriculture by leshoze	++	+	2
	• Taxes for using public agricultural lands (to leshoze and local administration)	+	+	P
	• Existence of measure to promote the use of non-wood forest products			
	• Evolution of the number of tourists	+	+	1
	• Promote the development of tourism	+	+	P
	• Evolution of the incomes from tourism (to leshoze and local economy)	+	++	2

The legal and institutional frameworks	• Develop community consultation and information tools	++	-	P
	• Number of organised groups	+	+	1
	• Review the systems of pricing and tariffs (mainly the taxes for pastures and for haymaking)	++	+	P
	• Review the legal status of public lands in favour of local communities (mainly lands for haymaking and for agriculture)	++	-	P
	• Review the status of leshozes and foresters	-	++	P
	• Part of leshozes' budget paid in taxes (cf annex n° 7)	-	++	2
	• Salary of foresters	-	++	P
	• Ensure minimum means to leshozes (mainly for transportation)	-	+	P
	• Develop new marketing methods to fit to market conditions	-	++	P
	• Ensure leshozes are working together to improve technical norms for stable forestry (mainly for plantations)	-	++	P

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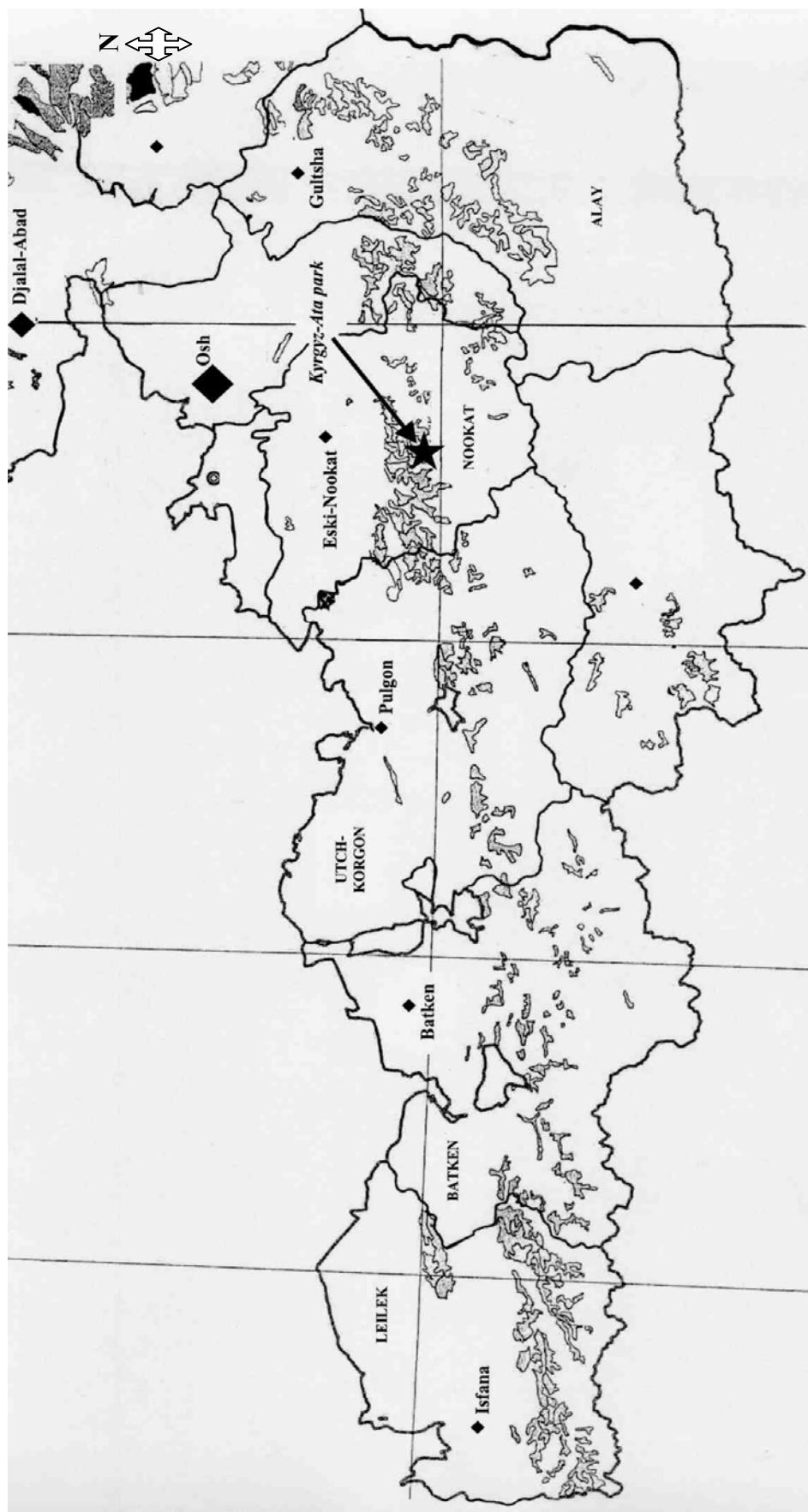
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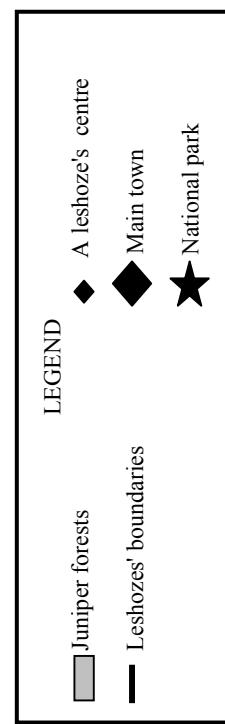
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Annex 1 : Map of the Juniper forests in South Kyrgyzstan



Scale : 1: 1 300 000
1cm = 13 km



Annex 2

Information about the leshozes and the national park taking part in the JUMP project

The area of the JUMP project includes 4 leshozes, 1 national natural park and 1 forest range, located in Osh and Batken oblasts (regions).

The Forest Service of the Osh oblast includes 4 leshozes, 2 forest ranges and 1 natural park. Among them, one leshoze, one forest range and the national park are taking part to the project :

- Nookat leshoze;
- Alay forest range;
- National park “Kyrgyz – Ata”;

Over the last few years, leshozes have been split into parts. The Alay forest range has been recently created from the Osh leshoze and is now independent. It can be considered as a leshoze.

The forest service of the Batken oblast includes 4 leshozes and 1 natural park. Among them, three leshozes are taking part to the project :

- Batken leshoze;
- Leylek leshoze;
- Uch – Korgon leshoze.

Most of the area of Juniper forests in South Kyrgyzstan is involved in the project. A small area of the Juniper forests in this region belongs to the leshoze of Osh.

All these forests are located in mountains and classified in the group I, according to the Kyrgyz classification.

The total area involved in the project (4 leshozes, 1 national park, 1 forest area) is 649,035 hectares. The area covered with Juniper forests is 100,610 hectares.

Natural parks are included into a category of especially protected natural territories (PE) alongside with reserves, zakazniks (a special category of protected areas) etc. They are intended for both preservation of natural ecosystems and reception of visitors wishing to have a rest and admire beauty of nature.

Not all the forest activities carried out in leshozes are allowed in national parks. Rules are more strict and felling area possible only for sanitary purpose or to improve the landscape.

Leilek leshoze

Leilek leshoze was created in 1983 from the division of Uch - Korgon leshoze. It includes the forests of Katran and Leilek located in West of Batken oblast, in Leilek district.

The territory of leshoze is shared in 4 forest ranges and 1 “mastersky uchastok” (it includes all tree nurseries) :

- Ozgorush forest area;
- Isfana forest area;
- Ak – Suu forest area;
- Leilek forest area;
- Mastersky uchectastok “Beles”.

The total area is 136,489 hectares, with :

- Covered by forest - 42,120 hectares;
- Pastures - 30,902 hectares;
- Agricultural lands - 311 hectares;
- The other grounds - 37,672 hectares.
- Leilek leshoze owns no land devoted to haymaking.

The area of Juniper forests is 31,330 hectares.

Reforestation is carried out: Juniper in mountains, and Almonds and Pistachio in valleys.

Leilek leshoze, adjacent to Tajikistan, suffers from the damage caused by foreign communities. Borders are generally located in mountains so that an effective control is impossible. Tajik people are mainly responsible for illegal felling and illegal use of pastures in Kyrgyzstan, but are out of control of foresters.

In Leilek leshoze, 155 persons are employed :

- Permanent employees - 43;
- Seasonal workers - 112 (figure for 2002, but it may vary from one year to another).

Leshoze's means (for transportation and to plough land)

Kind of a vehicle	Mark	Number	note
Buses	KAZV	2	1 is out of order
tractor wheel	MTZ – 80	2	1 is out of order
Automobile WD	VAZ 2121 “NIVA”	1	condition is bad

Director: Aliev Abdimalik Jetimishevich

Main forest engineer: Murzakulov Kurmanbek Abdilaevich

Office address : 715000, Ljajljak district. Isfana town, Lesnaya street 2

Bodies: (3256) 21267

Batken leshoze

Batken leshoze has been created in 1992 and is located in the center of Batken oblast, between Utch-Korgon leshoze and Leilek leshoze. It represents a whole area of 162,363 hectares, including :

- Covered by forest - 35,023 hectares;
- Pastures - 21,116 hectares;
- Lands for haymaking - 4 hectares;
- Agricultural lands - 32 hectares;
- The other lands - 80,962 hectares.

An important part of the leshoze's territory is occupied by poor, inconvenient, waterless lands like ravines or rocks. Forests are scattered in small places over the whole area of the leshoze. The main species is Juniper.

The area of Juniper forests is 24,542 hectares.

80 persons work in Batken leshoze :

- Constant employees - 42 persons.
- Seasonal workers - 38 persons.

Batken leshoze has particular problem with Tadjik communities leaving in and around the leshoze, especially with the enclave of "Vorukh".

On leshoze's pastures rent by the local population, the number of cattle is : about 400 horses, 3,600 cows and 7,200 sheeps or goats.

Leshoze's means (for transportation and to plough land)

Kind of a vehicle	mark	Number	Note
car, 4 WD	VAZ 2121 "NIVA"	1	
Caterpillar tractor		2	2 out of order
Wheel tractor		2	2 out of order
lorry	GAS - 53	1	Out of order
car	Moskvich - 412	1	Out of order

Director : Kimsanov Abdykalyk

Main forest engineer: Murzakulov Taalaybek Abdilaevich

Office address : 715100, Batken oblast, Batken town, leshoze

Bodies : (3622) 22359

Uch-Korgon leshoze

Uch-Korgon leshoze has been first created in 1948 and latter divided. It is located in the district of Kadamjay of Batken oblast. The territory of leshoze is divided into 4 forest ranges and one mastersky uchastok :

- Isfayram forest range;
- Kara – Jygach forest range;

- Shahimardan forest range;
- Haydarkan forest range;
- The mastersky uchastok of “Kutal””.

The leshoze represents an area of 140,939 hectares, with:

- Forested area - 34,738 hectares,
- Pastures - 19,175 hectares (27 % of pastures are not used because of remoteness);
- Lands for haymakings - 329 hectares;
- Agricultural lands - 38 hectares.

The main tree species are Juniper and Spruce (result of plantations), with also Birch and some fruit trees (apricot, pear and almonds).

The area of Juniper forests is 23,164 hectares.

During former USSR period, there used to be tourists coming in the leshoze, but since almost no foreigners – except Uzbek people – have come and the leshoze has no income from tourism.

The Utch-Korgon leshoze employees:

- Constant employees - 47 persons.
- Seasonal workers - 76 persons.

The leshoze owns 26 service horses.

Leshoze's means (for transportation and to plough land)

Kind of a vehicle	Mark	Number	note
Lorry		7	6 out of order
bus		1	out of order
automobile	VAZ 2121 “NIVA”	2	1 out of order
automobile	Muscovite - 412	1	out of order
Motorcycles		2	out of order
Wheel tractor		5	4 out of order
Caterpillar tractor		3	out of order

Director: Maksutov Abdunooman Matisakovich

Main forest engineer: Aldajarov Abdirazak Aldajarovich

Office address : 715210, Batken oblast, Kadamjay district, Pulgon v.

tel: (3655) 23587 (director), 23584 (the main forest warden)

Nookat leshoze

Nookat leshoze has been formed in the Osh oblast in 1996. It was before part of the Osh leshoze. The territory of leshoze is divided into 3 forest ranges and 1 mastersky uchastok :

- Apshir – Ata forest range;
- Kyzyr – Ata forest range;

- Altyn – Kazyk forest range;
- Mastersky uchastok “Jyde”.

The leshoze represents a total area of 67,903 hectares, with :

- Forested lands – 26,520 hectares;
- Pastures – 18,240 hectares (are used - 40 - 50 %);
- Haymakings - 314 hectares;
- Agricultural lands - 52 hectares.

The major tree specie is Juniper, on 12,356 hectares

The Utch-Korgon leshoze employees:

- Constant employees - 29 persons.
- Seasonal workers - 10 persons.

The leshoze owns no more than 1 caterpillar tractor ДТ – 75 and 3 horses.

Director : Atalov Djumanazar Tashtanbekovich

Main forest engineer: Elchibekov Jorobay Aslanovich

Foresters in charge of Kyzyr – Ata forest rang: Attokurov Umar

Office address : the Osh oblast, Nookat district, Jiyde v.

Bodies : (3230) 22101

Alay forest Range

Alay forest Range has been recently created as independent in January 2003. It is located in the Alay district of the Osh oblast and belonged before to the Osh leshoze. Though it has not yet the status of leshoze, it can be considered as such (and is likely to be soon established as a leshoze).

The total area represents - 130,169 hectares, with :

- Forested lands - 21,871 hectares;
- Pastures - 42,976 hectares;
- Lands for haymakings - 79 hectares;
- Agricultural lands- 93 hectares;
- Other lands – 65,150 hectares.

The area of Juniper forests is 7,337 hectares.

The leshoze's territory presents great potential form tourism and is already frequently visited by local tourists as well as foreigners (mainly mountaineers). There are also warm springs of water. The leshoze already receives incomes from tourism, although there are still not significant in the whole budget.

The leshoze's staff is constituted with 12 foresters. As the leshoze has been very recently created, it has had no seasonal workers so far and owns almost nothing.

Main forest engineer: Abdikalikov Anarbay

Office address : the Osh oblast, Alay district, Gulcha v.

Bodies: (3234) 26058

Natural Park Kyrgyz-Ata

This natural park has been created in 1992 in the territory of the Nookat district in the Osh oblast. It is located in the Juniper zone in South Kyrgyzstan and is to take part in the project.

The general area of the park represents 11,172 hectares, including :

- Forested lands - 2,283 hectares;
- Pastures - 3,325 hectares;
- Lands for haymaking - 14 hectares;
- Agricultural lands - 68 hectares;
- Other lands - 3,496 hectares;

The area of Juniper forests is 1,881 hectares.

Director: Murzakulov S.

Main forest warden: Tezekbaev T.

Office address : 715330, the Osh oblast, Nookat district, Kara – Koy v.

Annex 3 **List of the visited villages**

in Leilek leshoze

Ozgorush village (in Ozgorush forest range)

Andarak village

in Batken leshoze

Kaz village

Sellik village

Pasture “Suu-Bashy”

in Utch-Korgon leshoze

Kara-Shoro village

Pum and Kara-Ol villages

Pasture « Shivel »

Mountain camp « Dugaba »

in Nookat leshoze

Kurak-Tekyr village

Kuragan village

Moen-Kol village

in Alay forest range

Jany-Turmush village

Kitchi-bulolu

Pasture “Jyluu-Suu”

in the natural park Kyrgyz-Ata (one village)

Annex 4

Questionnaires for foresters and local people (non-foresters)

a) Questionnaire to Leshozes

Introduction

- introduce ourselves
- explain the purpose of the visit

It is the first step of a project aiming to establish and implement management plans for the Artcha forests of South Kyrgyzstan. A major concern is to involve all the stakeholders at each step of the project. As foresters, you will be in charge of its implementation. We would like to discuss with you to understand your perceptions and expectations regarding the management of Artcha forests.

- ensure attention

It is a unique opportunity to take part in the building-up process of the main goals of the forest management plans. Further works will be conducted over the next year with corresponding means to carry through the project.

General questions

Figures about leshozes are already registered and known. Some brief questions can help to go into the subject, but no time should be wasted at this stage.

- The leshoze (number and position of workers, assets, material)
- The forests (area, type, structure, age, height, standing volume...)

How do you manage forest?

Which are the main activities you conduct in forest?

- defence, protection of forests
- plantation, reforestation
- control of human activities in forests

Forest works

What kinds of works do you conduct in forest?

➤ Afforestation, reforestation

Plantation

- Which area of plantation by species
- Where saplings/grains come from?
- Do you protect plantations? Just signs or fences?
- Does people respect plantations?

Regeneration

- Do you use natural regeneration?
- On which surface, for which species?
- What is the level of successful regeneration?
- Do you close plots? What is the level of acceptance of these closed plots by local people

➤ Harvesting

- Is harvesting forbidden everywhere, for all species?
- Do you harvest for sanitary purpose?

➤ Protection against natural events

How many times per year do you control all forests?

Fire

- Are forest fires a significant problem in this leshoze?
- If yes,
 - What is the surface affected by fire?
 - Is there any infrastructure to prevent from forest fires?
 - Do you use grazing or hay making as a mean of preventing fires?

Pests and diseases

- What is the surface affected by pests and diseases?
- Do you have problem with pests and diseases?
- Is it particularly alarming for tree nurseries, plantations?

➤ Control of human activities

Illegal felling

- Is it an alarming problem?
- Can you estimate the annual volume illegally harvested?
- Close to the border of the country, do you have problems with foreigners practising intensive illegal felling?

Cattle grazing

- To which extent cattle grazing affect the natural regeneration of forests?
- Do people let cattle to graze out of their allocated pastures?

Firewood collection

➤ Use by local people

- What is the average volume of firewood used by a family in one year?
For summer, for winter?

- Which are the rents paid by local people to collect firewood? Is it a lump sum or per cubic meter? Any distinction between brushwood, firewood, wood already harvested?
- How do you estimate the volume available for collection?
- Do you think the volume available could fulfil the needs of local people or other sources of energy are necessary?
- What is the proportion of wood used for construction?

➤ Organisation of firewood collection

- Is there any organisation for firewood collection? How does it work?
 - Who collects the firewood?
 - Which wood can be collected, and where?
 - How do you make sure local people collect only what they have paid for?
- Do you forbid collection in some part of forest? Is it effective?
- Should a regulation of firewood collection be established?
- Has the amount of firewood given free of charge to a family to be restricted by law? Depending on which criteria?
- What should be the price of the firewood sold to people, depending on the quality, quantity and social status of clients?
- Is charcoal production compatible with the forest possibilities? Has it to be forbidden, due to the loss of energetic value?
- Is leasing a possibility in *Artcha* forests for assuming maintenance through firewood production?
- Is it possible to promote plantations of wood for fuel?

➤ Other energy sources

- Which other energies local people use (coal, electricity, gas, muck from animal...)? In which quantity per year and at which price?
- How to make these energies cheaper to reduce the use of firewood?
- In term of energy produced, how many cubic meters of wood represent one ton of coal, a bottle of gas...

Cattle grazing

➤ Needs of local people

- What is the proportion of families with cattle?
- What is the average cattle composition for the families with cattle?
- Which are the rents paid by local people to graze cattle on leshoze or village pastures?
- At the time being, are there enough pastures?
- What is the current evolution of cattle in the leshoze?
- Does the lack of pastures may be problematic in the following years?

➤ Organisation of cattle grazing

- How do you organise cattle grazing?
- Do you allocate a particular land to each shepherd?

- Is there any organisation to limit effect of grazing?
 - Pasture land rotation
 - Close some part of land for one or two years
 - How did it work before
- Can you limit the number of cattle?
- Does it need a common organisation of grazing, or is this organisation compatible with individual's strategies?
- What should be the role of leshozes in this organisation?
- Could non-foresters be in charge of grazing regulation?
- How to introduce incentive means for grazing regulation? Which other techniques to limit cattle pressure?
- What are the limits of cattle pressure on tree and grass regeneration?

Hay making

- Needs of local people
 - Which amount of hay is necessary to feed cattle during winter?
 - Do people make hay on leshoze's lands or mainly in other lands? In which superficies? What are the rents per hectare?
- Possible organisation
 - What should be the role of leshozes in regard to hay making?
 - How to calculate the price of hay to be eventually sold considering the place, the quantity of hay harvested, and the social status of the client?

Other uses of natural resources

- Agriculture
 - Which area people use for agriculture? What are the rents paid (in money or in kind)?
- Hunting
 - Is it allowed to hunt? Can hunting represent a significant income?
- Tourism
 - Are there any tourists in the leshoze area?
If yes
 - What has been the evolution of the number of tourist?
 - Is there any equipment for tourists?
 - Does leshoze receive any income from tourists?
- Honey, medicinal plants, mushrooms...
 - Do you control this kind of uses (honey...)?
 - Is there any tax for that?
 - Should leshozes promote other uses such as honey making?

Perception of forest resources

➤ Conservation of forest resources

- What do you think are your main functions regarding to forest management?
 - Forest protection
 - overgrazing
 - firewood collection
 - illegal felling
 - fire
 - Afforestation, reforestation
 - Fulfil the needs of local people with ensuring sustainable management
- Do you think forest is being degraded?
- What do you think are the main threats on forest conservation?
 - Illegal felling
 - Cattle grazing
 - Fire, pests and diseases...
- To which extent does the pressure from local people affect forest?

➤ Perception of forest resources for the local community

- Do you think local community is dependent on forest? For which main reason?
- Do the current resources fulfil most of the needs of local people? Is the protected status of all Artcha trees compatible with the social demands for wood?
- Do you think local people are aware of forest issues?
- Do you think local people are well aware of forest legislation?

Needs and constraints

➤ Lack of means

- What are the current means of the leshoze (for transportation, forest work and control...)?
- What are the materials you need the most?

➤ Foresters status

- How should be enhanced the foresters' status?
- What is your current salary? What would you expect to have?

➤ Institutional framework

- To which extent forest management decision are made at leshoze level?
- How revenues from forest management are distributed?
 - Which part remains in leshozes?
 - What is the national allocation to leshozes?
- Which degree of autonomy should leshozes have?
- Which part of the revenues should be reinvested in leshoze?

Relationships with local people

➤ Conflicts

- Do you have conflicts with local people?
- For which main reasons?
 - Collect more firewood than what they have paid for
 - Harvest protected species, harvest roots of plants
 - Graze out of their pastures
 - Do not pay the rents
- Do you fine local people?
- Are your relationships worst or better? Why?
- Which incentive means to promote?
- What to do to improve relationships?

➤ Involvement of local people

- Are local people involved in forest works?
- Is there any organisation for that?
- Are they paid for this work? In money or in kind? How much?
- Are local people willing to work with foresters? For which reasons?
- What about an organisation to involve local people in forest works (plantation, tree nurseries but also wood collection, hay making...) and pay them in kind (mainly with firewood or hay)?
- Can local people take part in forest management? Are they willing to do that?

New management plans for Artcha forest are to be established. What do you think should be the features of these new management plans? (promote afforestation/reforestation, use fast growing species, ensure an effective control of human activities in forests, develop incentive tools to involve local people in forest management...)

b) Questionnaire to local people

Introduction

- introduce ourselves
- explain the purpose of the visit

It is the first step of a project aiming to establish and implement management plans for the Artcha forests of South Kyrgyzstan. A major concern is to involve all stakeholders at each stage of the project, from the definition of objectives to the follow-up. In order to do that, we would like to discuss with you to understand your perception of the situation and your expectations regarding the future management of Artcha forests.

- ensure attention

It is a unique opportunity to take part in the building-up process and make forest management change in your way. It belongs to you to be involved in the project or not.

General questions

To conduct interviews with villagers, a broad understanding of the features of the village is felt necessary.

the village (size, national repartition: kyrgyz, ouzbeck, tadjik... job repartition: shepherd, farmer... employment)

cattle belonging to the village (number of cattle, sheep, cows...)

Use of forest resources

Which are the main goods and services of forests you use?...

Firewood collection

➤ Use of firewood

- Which average volume of firewood do you use annually for a family?
For summer, for winter?
 - Is it enough for your needs?
 - Do you collect everything yourselves?
 - Do you find it difficult to collect firewood, given the interdiction of felling trees?
- Which rents do you pay to collect firewood? Is it a lump sum or per cubic meter? Is there any distinction between brushwood, firewood, wood already harvested?
- Which proportion of wood do you use for construction?

➤ Organisation of firewood collection

- Is there any organisation for firewood collection? How does it work?
 - Who collects the firewood?
 - Which wood can be collected, and where?
- Should a regulation of firewood collection be established?
- What should be the price of firewood?

➤ Other energy sources

- Which other energies do you use (coal, electricity, gas, muck from animal...)? In which quantity per year and at which price?
- In term of energy produced, how many cubic meters of wood represent one ton of coal, a bottle of gas...
- Do you find the cost of other energies very expensive? Is it more than firewood?
- Which should be the price of coal to make sure that you don't use firewood any longer?
- Which part of the price of a ton of coal is used for transportation?

- How to build-up a more efficient organisation to reduce the price of coal?

Cattle grazing

- Use of pastures
 - What is the proportion of families with cattle?
 - What is the average cattle composition for the families with cattle?
 - What is the current evolution of cattle size?
 - Which rents do you pay to graze cattle on leshoze or village pastures?
 - Do you think you have enough pastures? Is the quality of pastures suitable?
 - Does the lack of pastures may be problematic in the following years?
- Organisation of cattle grazing
 - How pastures are allocated to shepherds? On a whole for a group of people or individual pieces of land by shepherd?
 - Is there any common organisation of cattle grazing or all families graze their own cattle?
 - Do you think a common organisation can limit human pressure on forest?
 - Do rents for pastures represent a greater or smaller part than your annual budget for energy?
 - Could non-foresters be in charge of grazing regulation?

Hay making

- Use of hay making
 - Which amount of hay is necessary to feed cattle during winter?
 - Do you make hay on leshoze's lands or mainly in other lands? In which superficies? What are the rents per hectare?
 - Do you have enough lands for hay making or can it be problematic?
 - Do rents for hay making represent a greater or smaller part than your annual budget for energy?
- Possible organisation
 - Which possible organisation to facilitate and promote hay making?

Other uses of natural resources

- Agriculture
 - Which average area do families use for agriculture? What are the rents?
- Hunting
 - Is it allowed to hunt? Can hunting represent a significant income?
- Honey, medicinal plants, mushrooms...
 - How many people produce honey or collect medicinal plants? Are these other uses significant in the village economy?

- Is there any tax for that?

➤ Tourism

- Are there any tourists around the village?

If yes

- What has been the evolution of the number of tourists?
- Is there any equipment for tourists?
- Do you think it could represent a substantial revenue?

➤ Cultural and spiritual values

- Is there any cultural and spiritual site around the village?

Perception of forest resources

➤ Use of forest resources

- Do you think you are dependent on forest resources? For which main reason?
- Do you think forests can provide enough firewood for the local community without being degraded?
- Do the current resources fulfil most of your needs?

➤ Forest fragility

- Do you consider forests as a fragile resource?
- Do you think forests are being degraded?
 - Is it more and more difficult to collect firewood?
 - Is the quality of pastures the same than before?
- If you think forests are being degraded, which do you think are the main reasons?
 - Illegal felling. Is there illegal felling around the village?
 - Cattle grazing. Do you think cattle grazing can affect forest regeneration?
 - Fire, pests and diseases...
- To which extent do you think the pressure from local people affects forest?
- Do you know the forest legislation? Do you agree with the protective status of Artcha forests?
- Do you think forests have protective functions such as soil conservation and watersheds regulation?

Relationships with local people

➤ Conflicts

- Do you have conflicts with foresters?
- For which main reasons?
 - You collect more firewood than what you pay for because it is too expensive
 - You harvest protected species or roots of plants
 - You graze out of your pastures

- You do not pay the rents
 - You think foresters abuse of their rights
 - Do foresters fine you?
 - Are your relationships worst than before? For which reasons?
 - What to do to improve these relationships?
- Involvement of local people
- Are you involved in forest works?
 - Are you willing to work with foresters?
 - For which reasons?
 - You are paid for the work.. In money or in kind? How much?
 - You receive grants from the State if you have a job.
 - Is there any organisation to involve local people in forest works (plantation, tree nurseries but also wood collection, hay making...) and pay them in kind (mainly with firewood or hay)?
 - Would you like to take part in forest management? How?

What to do?

What do you think could be done to improve the use of forest?

What do you think should be done to improve the life level?

Which project would you propose if you were given enough money to do it?

Annex 5: Table of results from the interviews to foresters

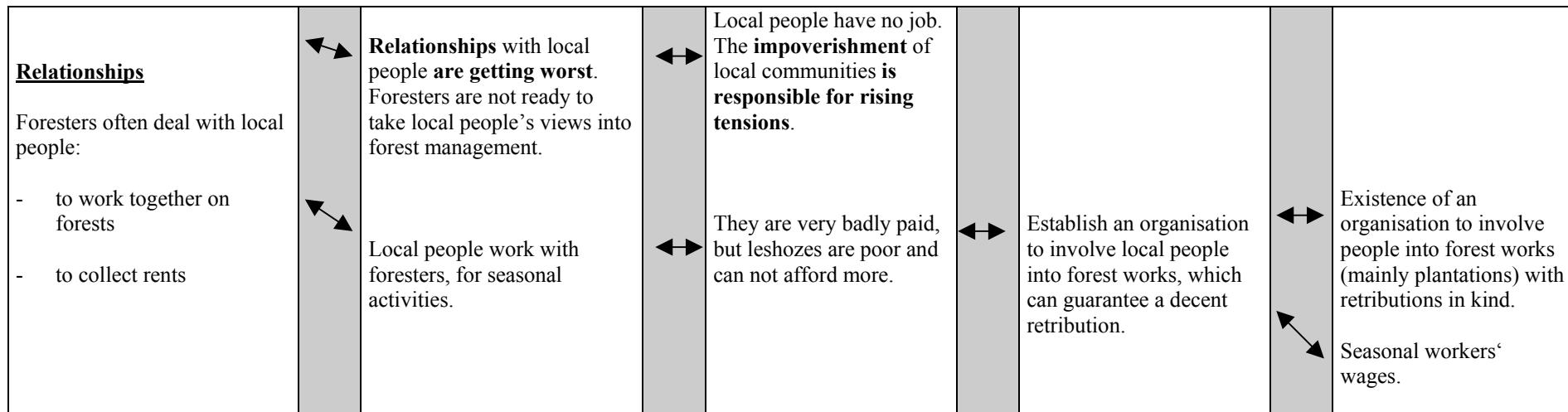
Main activities conducted in forest	Foresters' understanding of forest management	Constraints in the management of forests	What foresters would like to be done	Corresponding indicators
<p>Main activities conducted into forests:</p> <ul style="list-style-type: none"> - Defence, control - Plantation 	<p>Foresters' main role is to protect forests from degradation.</p> <p>Forests' major threats:</p> <ul style="list-style-type: none"> - Mainly, over-collection and illegal felling - Cattle overgrazing is no longer an issue. - Fire, pests & diseases can be worrying in some places. <p>On the whole, forests are being degraded from human pressure.</p> <p>Local people are dependent on forests. They are on the whole aware of the importance of forests...</p> <p>Low foresters' status</p> <p>Leshozes are poor, do not have enough revenues</p>	<p>Local communities are poor and have no other resource than forests.</p> <p>Over collection and illegal felling are responsible for great damages to forests.</p> <p>...but have no other resources than forests.</p> <p>Very low salary, lack of uniforms, weapons...</p> <p>Important part of leshozes' budget is used to pay taxes.</p> <p>Lack of means, mainly for transportation.</p>	<p>Develop jobs to local people.</p> <p>Develop tools to prevent illegal felling.</p> <p>Improve foresters' status, raise salaries.</p> <p>Review the taxation system of leshozes.</p> <p>Provide means to leshozes (especially cars and horses).</p>	<p>Number of jobs related to the forest sector by leshoze.</p> <p>Number of new jobs created annually in the leshoze area.</p> <p>Existence of incentive tools to prevent illegal felling.</p> <p>Number of foresters by leshoze:</p> <ul style="list-style-type: none"> - paid by the state - paid by the leshoze (seasonal workers) <p>Foresters' salary. Part of leshozes' budget used to pay taxes.</p> <p>Take measures to ensure all leshozes have a minimum of means.</p> <p>List of material and assets belonging to leshozes.</p>

<u>Works in forest</u>		Impossible to ensure an effective control of forests		Most of local people break law to live.		Clearly defined the boundaries of the forest fund.		Take measures to clearly establish the boundaries of the forest fund
Control forests	↔	Due to recent changes of legislation, foresters do not always know clearly which areas they are in charge of.	↔	Area with forest status are not always clearly established.	↔	Clearly defined the boundaries of the forest fund.		Take measures to clearly establish the boundaries of the forest fund
Carry on plantations	↔	Forests will disappear if foresters do not replant and protect them.	↔	Lack of machines (tractors...) to maintain tree-nurseries and to carry out plantations.	↔		↔	Area annually planted by leshoze.
- Only tree-nurseries are fenced. They can use signs to indicate plantations, but most of the time foresters keep an eye on.	↔	Local people respect plantations . They generally consider there is a need to replant . Need to watch plantations to protect them from cattle.	↔	It would be too expensive to fence plantations	↔		↔	Area of plantations spoilt by cattle.
- Leshozes have usually enough tree-nurseries to produce seedlings for plantation (they even sell the surplus). They sometimes have to buy seeds.	↔	Seeds can be expensive Need to treat forests against pests and diseases, especially young trees in nurseries.	↔	No money to buy seeds Chemical treatments too expensive. Leshoze can not afford them.	↔	Establish a special fund to buy seeds. Ensure all leshozes can have enough seeds. Establish a special fund to buy treatments for pests and diseases	↔	Existence of a fund to buy seeds for leshozes. Existence of a fund to buy treatments for forest pests.
Give way to natural regeneration	↔	Natural regeneration of Artcha is not bad . It is visible in many places.	↔		↔		↔	Area with successful regeneration of Artcha.
Almost no harvests of timbers , even for sanitary purposes.	↔	Foresters are already striving to replant, and local people through illegal felling remove at first the dead, ill trees.						

Forest control						Estimation of the volume of illegal felling
Use of firewood		Local people need firewood on pastures in summer as there is no other energy. But most of firewood is used during winter, especially to heat.	There is not enough firewood to fulfil the local people's needs for energy. It becomes more and more difficult to harvest firewood close to villages.	Develop incentive measures to prevent illegal felling. Develop the use of muck from animal.		Proportion of energy from muck.
- Allocate to people part of forest where to harvest firewood.		Other sources of energy are expensive.	Non-wood energy are expensive , local people prefer firewood.	Bring down the costs of substitute energies.		Amount of the different sources of energy used annually by family in equivalent m³ of wood.
- Collect the taxes for firewood (for brushwood and logs). Local people buy on average for 2 or 3 m ³ .	↔	No organisation of firewood collection. Local people collect firewood themselves.	No transparency in the amount of firewood collected. It requires a strong control. Firewood price would go up (and become more expensive than coal). Local people would not be able to buy it.	Build-up an organisation led by leshoze for firewood collection.		Prices of the different sources of energy.
- Control firewood collection.	↔	Foresters would prefer to lead the harvest and sale of firewood.	Foreign communities are out of control, especially around the Tajik and Uzbek enclaves in South Kyrgyzstan, with slack borders.	No effective control possible. Need to close borders (just impossible!).		Existence of measures to bring down the price of alternative energies.
	↔	Foreign communities can be responsible for great damage to forests. After felling trees, they just escape back in their country (Tajikistan or Uzbekistan).				Existence of an organisation led by leshozes for harvesting firewood.
						Areas of forests affected by illegal felling from foreign communities.

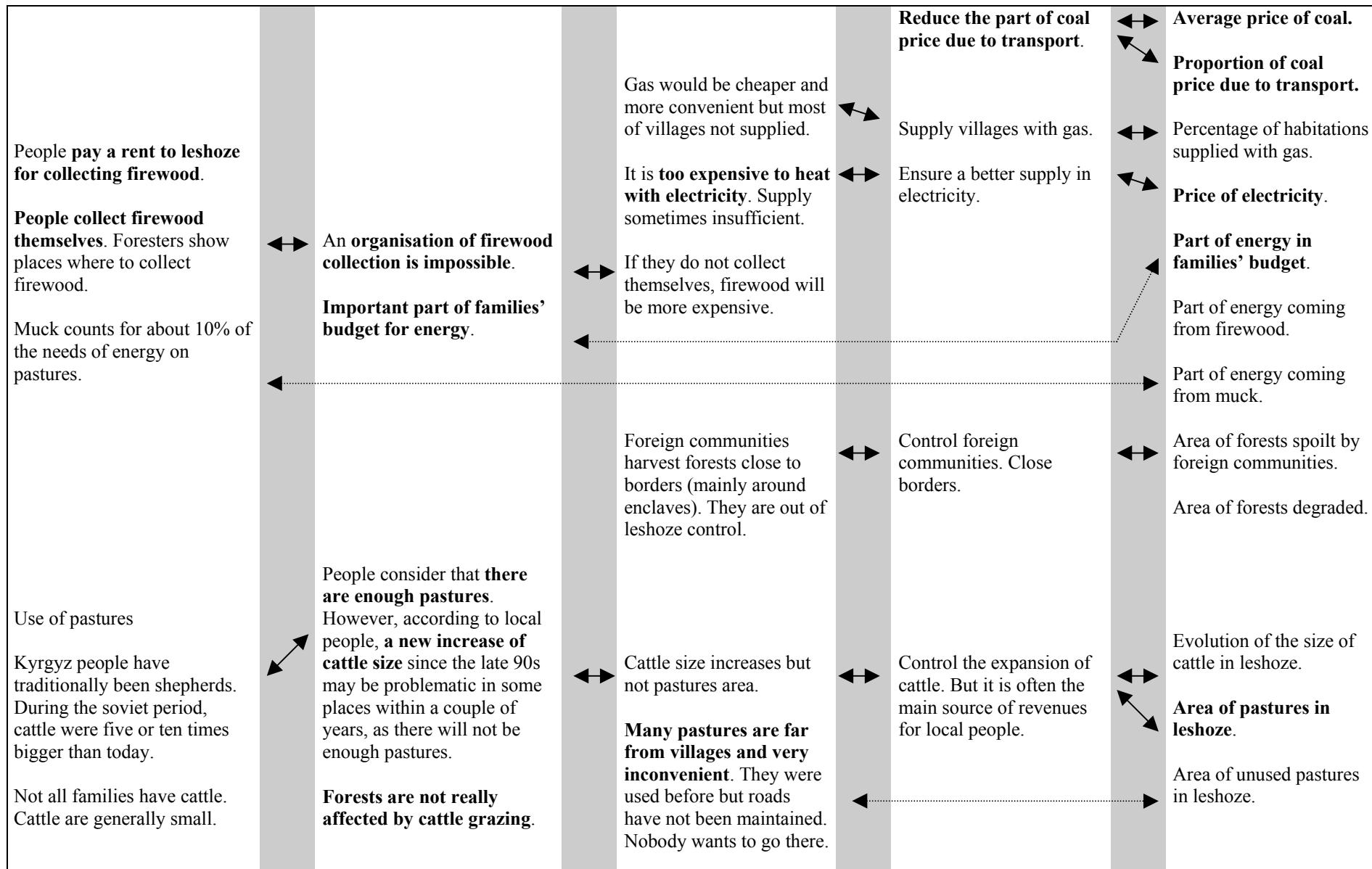
<p>Cattle grazing</p> <ul style="list-style-type: none"> - Allocate pastures to shepherds. - Collect the rents for the use of pastures. - Control cattle grazing. 	<p>There are generally enough pastures and the quality is satisfactory.</p> <p>Cattle have been increasing again over the last few years. But there were much more cattle before, so there should be enough pastures. However, in some places, the lack of pastures may soon be problematic.</p> <p>Cattle graze into forests and not just on pastures.</p> <p>It limits the number of people in pastures and the pressure on forests. The need of firewood is much lower. It is also easier for foresters to collect the leases for pastures</p> <p>There are some big cattle belonging to rich people. They do not use the same pastures as local people.</p>	<p>Foresters can not limit the number of cattle. It is the main source of income in rural area.</p> <p>The less convenient pastures used before (far from village, with steep slope) are not grazed and shepherds do not want to go there.</p> <p>In such huge areas, control of cattle grazing almost impossible.</p> <p>No conflict-provoking relationships with local people.</p> <p>Again, problem with foreign communities.</p>	<p>Inform people, make them aware of the consequences of overgrazing.</p> <p>Fix roads to unused pastures, reduce taxes for using these remote pastures.</p>	<p>Area of pastures by leshoze</p> <p>Evolution of cattle's size.</p> <p>Existence of incentives tools to limit cattle grazing.</p> <p>Area of unused pastures by leshoze.</p> <p>Annual leases pay for pastures to leshoze or local administration.</p> <p>Area of forests damaged by cattle grazing.</p> <p>Amount of annual fines by leshoze.</p> <p>Number of organised groups for breeding cattle</p> <p>Existence of incentive tools to promote common organisation of cattle grazing.</p> <p>Areas of pastures grazed illegally by foreign communities.</p>

<p>Hay making</p> <p>Most of hay – to feed cattle in winter – is made on private lands.</p> <p>Leshozes have generally few lands for haymaking (which can be rent to local people, as pastures).</p> <p>Use of agricultural lands Most people have their own plots of lands to grow vegetables. Leshozes also rent some agricultural lands.</p> <p>Use of non-wood forest products. - honey - medicinal plants - fruits and berries - hunting...</p> <p>Use of forests for recreation</p>	<p>Local people have generally enough lands to make hay, or manage to buy each other.</p> <p>However, it can be sometimes difficult for people to make enough hay for winter.</p> <p>South Kyrgyzstan is poor in agricultural lands and irrigation is always required in the Juniper zone.</p> <p>Despite an interesting potential, local people use non-wood forest products only for domestic purposes. Leshoze does not have any income from these uses.</p> <p>There is an important potential for tourism.</p>	<p>Transportation's cost sharply increases the price of hay.</p> <p>Local people grow potatoes in forests and damage forests</p> <p>Rural people are poor and prefer themselves to collect non-wood forest products in forests. No valorisation of these resources for leshozes.</p> <p>Lack of facilities for tourism.</p> <p>Recent kidnappings have strongly affected the development of tourism.</p>	<p>Average amount of hay used annually by a family.</p> <p>Market price of hay.</p> <p>Area of leshozes' lands devoted to haymaking.</p> <p>Number of fines to local people</p> <p>Area of agricultural lands rent annually by leshoze.</p> <p>Existence of measures to promote the uses of non-wood forest products.</p> <p>Leshozes' incomes from non-wood forest products.</p> <p>Existence of measures to promote tourism.</p> <p>Leshozes' incomes from tourism.</p> <p>Annual number of tourists in leshozes.</p>
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Annex 6: Table of results from the interviews to local people (non-foresters)

Local people's use of natural resources	Local people's perception of forest resources	Constraints in the use of forest resources	What would local people like to be done	Corresponding indicators
<p>Main uses of forest resources: firewood collection cattle grazing</p> <p>Uses of forest resources</p> <p>Use of energy (figures for one family) In summer on pastures, firewood (and muck) is the only available energy. A family uses around 2-3 m³ in summer (people pay a lump sum or by m³, depending on the village).</p> <p>In winter, they need firewood at least to set fire to coal. Given the cost of other energies, local people use as much as firewood as possible, 3 to 8 m³.</p> <p>The main energy used in winter is traditionally coal. They use 1 to 4 tons.</p>	<p>They are aware of the importance of forest resources and think they are dependent on them.</p> <p>They think there is a need to protect forests and generally agree with the protected status of forests. They know the legal interdictions regarding forest use.</p> <p>Local people understand forest can not supply everybody in firewood.</p> <p>They know that forests are threatened, but they need firewood and can hardly buy other energies more expensive.</p> <p>They need to go farther and farther from villages to collect firewood.</p> <p>They are worrying about the future of forests if other energies remain so expensive.</p>	<p>People really need wood and the protected status of forests compels them to break the law.</p> <p>Artcha forests grow very slowly and forested area too small. There is not enough firewood.</p> <p>High rate of unemployment.</p> <p>Very low salaries.</p> <p>More and more difficult to collect firewood, life is getting harder.</p> <p>Coal much more expensive than during soviet period.</p>	<p>Develop incentive tools to prevent illegal felling.</p> <p>Take measures to bring down the prices of others energies. Provide a better supply and make them easily affordable.</p> <p>Conduct plantations.</p> <p>Create new jobs for local people.</p> <p>Ensure a minimum decent salary.</p>	<p>Existence of incentive tools to prevent illegal felling.</p> <p>Existence of measures to bring down the price of alternative energies.</p> <p>Annual area of plantations by leshoze.</p> <p>Amount of firewood sold annually by leshoze and price/m³.</p> <p>Number of jobs related to forest sector by leshoze.</p> <p>Number of jobs created annually by leshoze.</p> <p>Average salary in rural area.</p> <p>People perception of their life level.</p> <p>Average amount of coal used annually by family (1 ton of coal = 4 – 5 m³ of firewood).</p>

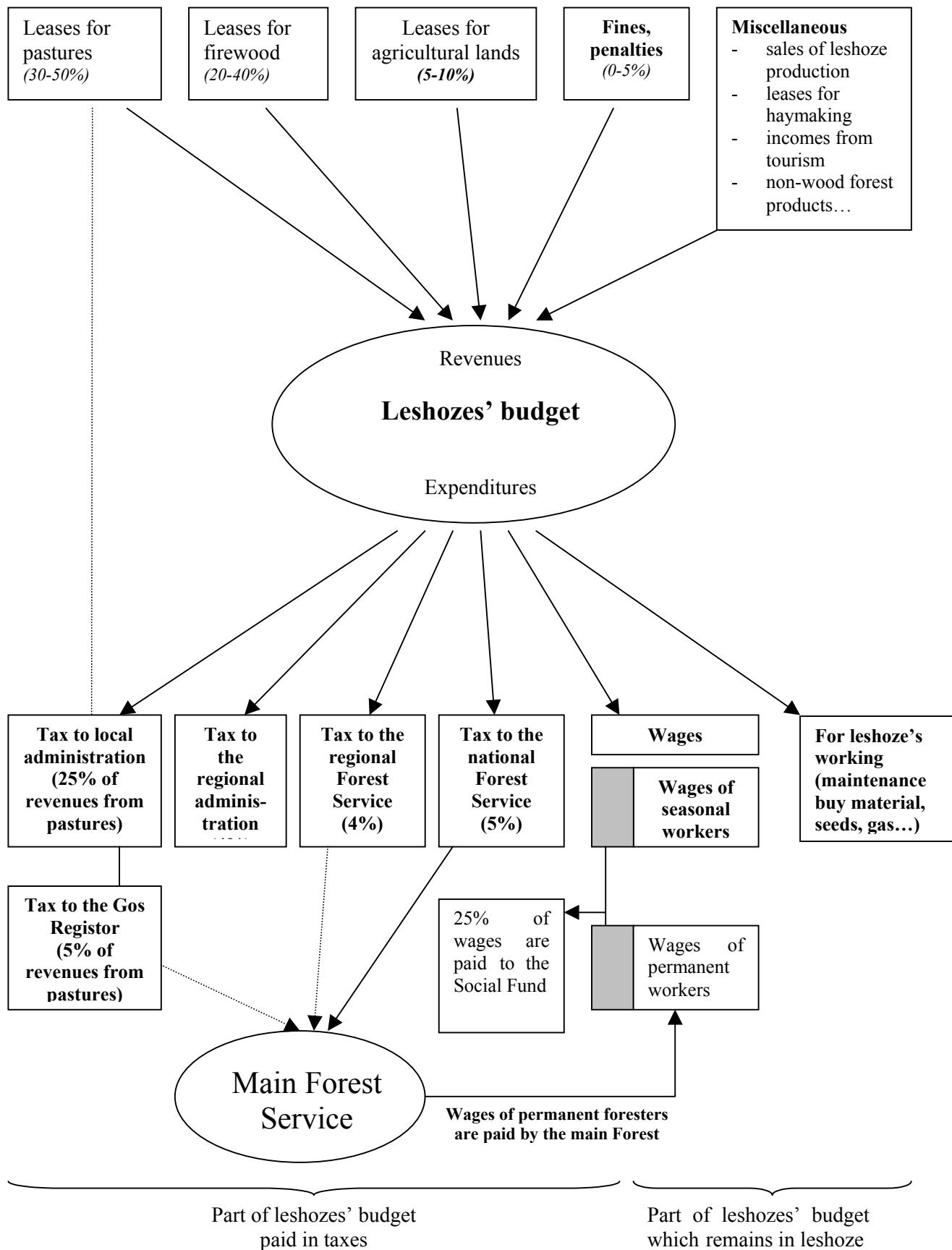


<p>Shepherds pay a rent for using pastures.</p> <p>Common organisations of cattle grazing between local people, with no forester.</p> <p>People pay shepherds to keep their cattle.</p> <p>Families gather their cattle and stay in turn on pastures to look after the whole cattle.</p> <p>There are some big cattle grazing around villages and belonging to rich people.</p> <p>Use of hay</p> <p>Local people harvest hay to feed cattle in stables in winter (around six months by year).</p> <p>They often use their own lands or buy each other.</p>	<p>It is not worth to spend the whole summer in pastures just for small cattle. People can stay in villages. Most of them are farmers.</p> <p>It limits the number of people in pastures and the pressure on forests. The need of firewood is much lower. Muck itself can provide half of the shepherds' needs of energy.</p> <p>These cattle often use other pastures than local people's cattle. They do not cause any problem.</p> <p>Most of the time, local people have enough place where to make hay.</p>	<p>Many people still prefer to graze themselves their cattle, they do not have other jobs.</p> <p>Shepherds are afraid to lose animals. They would have to refund them.</p> <p>Shepherds can not build houses on pastures. They can use yorts or tents but it is too expensive.</p> <p>Again, pastures close to borders are often used by foreign communities, which neither respect allocations nor pay rents.</p> <p>When people do not own plots of lands, it can be problematic and very expensive to gather enough hay for winter.</p>	<p>Develop incentive tools to promote this kind of common organisation.</p> <p>Review the law and make possible the construction of shelters on pastures.</p> <p>Control foreign communities. Close borders. But local people know it is almost impossible.</p> <p>Provide enough lands to make hay.</p>	<p>Annual rent pay for using pasture to leshoze or local administration (by sheep, cow and horse).</p> <p>Number of families arranging the grazing of their cattle in common</p> <p>Existence of incentive tools to promote common organisation of cattle grazing.</p> <p>Areas of pastures grazed illegally by foreign communities.</p> <p>Average amount of hay used annually by family (function of cattle size).</p> <p>Leshoze's area devoted to haymaking.</p> <p>Average area of lands owned by family.</p> <p>Market price of hay.</p>
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	Leshozes have few lands used for haymaking.			Rent by hectare paid to leshoze to make hay.
• They can rent leshozes' lands.	Local people generally manage to grow themselves vegetables, at least potatoes.	Some lands suitable for agriculture are forbidden to use (in forests for instance).	Allow growing potatoes in some parts of forests. Develop irrigation (or rather repair former irrigation system).	Area of leshoze's lands devoted to agriculture. Evolution of irrigated lands by leshoze. Rent by hectare paid to leshoze to use agricultural lands.
Use of agricultural lands Most of people have their own vegetable garden. They use their own plots of land. They rent lands leshoze.	They have not enough lands for agriculture. Most of them need irrigation. All these minor uses of forests do not represent significant revenues. They are most of the time limited to domestic use. Good potential for honey making. Used to be more important before	Hunting is allowed just one or two months a year. People have scarcely weapons. People impoverishment has shrunk the market for honey. Know-how has disappeared	Develop the use of these non-wood products	Existence of measures to promote the use of non-wood forest products. Evolution of the number of beekeepers.
Use of non-wood forest products • Hunting • Mushrooms, medicinal plants... • Honey making Use of forests for recreation Local people also consider forests as a place to rest. Landscapes are beautiful and during summer, the temperature in mountain is cooler.	There is an important potential for tourism. It is sometimes considered as the best possible income. There were already tourists during the soviet period.	Lack of facilities for tourism. Recent kidnappings of foreigners between 1999 and 2001 have strongly affected the development of tourism.	Develop facilities and equipment to promote tourism. Need to ensure the security of tourists.	Existence of measures to promote tourism. Density of footpaths for mountaineers. Annual number of tourists. Incomes from tourism

Cultural and spiritual values in forests	There are some sites in forests granted with particular values, but they are not the subject of strong beliefs .	Local people and foresters have opposite interests .	Existence of a list of places with cultural or spiritual values
	Relationships with foresters Local people often deal with foresters: <ul style="list-style-type: none">• to pay taxes for using firewood, pastures or agricultural lands,• to work with foresters in forests,• to talk about problems in forest, decide on forest management...	They consider their relationships are still good, but getting worst . The diminution of life level breeds conflicts with foresters, as people are reluctant to pay taxes. The main subject of conflicts is firewood . Local people are willing to work with foresters . It is better to have a job rather than nothing. Decision making in forest management is still entirely led by foresters.	Local people are afraid of being fined . Local people are paid almost nothing , even when they are paid in kind. Conflicts with foresters make difficult the local people involvement in forest management.

Annex 7 : The budget of leshozes



Annex 8 : The Near East process

Criteria	Indicators
1 Extent of forest resources	<p>1 Area and percentage of forests and other wooded lands (including plantations, agroforestry, shelterbelts) with their change over time (deforestation/ reforestation/ conversion)</p> <p>2 Biomass/standing volume, growing stock, carbon stock.</p> <p>3 Area and percentage of forests for which management plans are made</p> <p>4 Area and percentage of forests and other wooded lands which have been demarcated</p>
2 Conservation of Biological diversity in forest area	<p>Ecosystem Indicators:</p> <p>1 Distribution of forest ecosystems (area by type of vegetation, natural or man-made)</p> <p>2 Areas of forest reserves and protected areas</p> <p>3 Spatial fragmentation of forest resources</p> <p>4 Excisions affecting rare ecosystems by area</p> <p>Species Indicators:</p> <p>5 No. of forest dependent species (fauna, flora)</p> <p>6 Area and number of species at risk in forest areas</p> <p>7 Extent of mixed stands</p> <p>8 Reliance on natural regeneration</p> <p>Genetic Indicators:</p> <p>9 Existence of the number of seed provenance</p> <p>10 Number of forest dependent species with reduced range</p> <p>11 Population levels of key species across their range</p>
3 Health, vitality and integrity	<p>External influence indicators:</p> <p>1 Areas and percentage of forest (plantations/natural forests) affected by : natural fires, storms, insects and diseases, drought, and wild animal.</p> <p>Forest vitality indicators:</p> <p>2 Area of natural forests with healthy regeneration</p> <p>3 Incidence of defoliation</p> <p>Anthropogenic influence indicators (site degradation):</p>

	4 Area of encroachment for farming, urban expansion and unplanned tourism 5 Average annual consumption of fuelwood per capita 6 Area and number of fires caused by people 7 Grazing damage by domestic animals 8 Competition from introduced plants 9 Trends in crop yields
4 Productive capacity and functions	1 Percentage of forests and other wooded lands managed according to an integrated management plan 2 Annual balance between wood increment and wood harvesting and trends 3 Wood production 4 Non-wood forest products outputs including, among others, aromatic and medicinal plants
5 Protective and environmental functions	<p>Protective functions:</p> 1 Extent of forests and other wooded lands managed for protection purposes 2 Size and percentage of wooded areas managed mainly for the protection of watersheds 3 Areas managed for scenic and amenity purposes 4 Areas managed for soil protection <p>Combating land degradation:</p> 5 Area of sand dunes annually stabilized through tree/shrub planting 6 Area of eroded hillsides annually rehabilitated through tree/shrub planting 7 Efficiency of trees/shrubs planted in stabilizing sand dunes or rehabilitating eroded hillsides 9 Effectiveness of plans formulated for managing trees/shrubs planted for desertification control. 10 Extent of combating desertification
6 Maintenance and development of socio-economic functions and conditions	<p>Indicators of economic conditions :</p> 1 Value of wood products 2 Value of non-wood forest products 3 Value of recreation 4 Value of hunting 5 Share of forest sector in GNP/GDP 6 Value from secondary forest industries

	<p>7 Value from biomass energy</p> <p>8 Forest trade balance</p> <p>9 Level of investment in forest sector and forest products based industries</p> <p>Indicators of the distribution of benefits:</p> <p>10 Employment generation in the forest sector</p> <p>11 Forest dependent communities involvement (numbers of organized groups and women)</p> <p>12 Contribution to agricultural development</p> <p>13 Rate of improved livelihood of forest dependent communities</p> <p>14 Share of benefits from forest areas in the family income of forest region communities</p> <p>15 Contribution to food security</p> <p>Indicators of participation among stakeholders in forestry:</p> <p>16 Grassroots participation and equity</p> <p>17 Number and area of resettlement schemes for people living in the forest</p> <p>18 Reduction in the number of forest offenses</p> <p>19 Interest and contributions of the rural communities, media, NGOs, politicians and the public in general for the conservation and development of forests and forestry</p>
7 The legal and institutional frameworks	<p>1 National forest policy, legislation and regulations</p> <p>2 Institutional instruments and tools</p> <p>3 Concrete implementation and capacity to monitor</p> <p>4 Economic framework and financial instruments</p> <p>5 Community consultation and information tools</p> <p>6 Research and extension capacity</p> <p>7 Valorization of local expertise, knowledge, and local technologies</p> <p>8 Transfer and adaptation of appropriate technologies</p> <p>9 Capacity to implement international instruments</p>

- CORNET J.G & RAJAPBAEV M., 2004 : *Criteria and Indicators for Sustainable Management of Juniper Forests in South-Kyrgyzstan*. Nancy, Ecole Nationale du Génie Rural, des Eaux et des Forêts, Commission of the European Communities, Artcha JUMP Project. 96 p.