Mountain juniper in our world

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Introduction

Forestry means the life. All of them have an important job to do - safe the water, safe the same life. By the way quite special role perform mountain juniper forests (archa as many Central Asian's people, call them). No one tree do not penetrate so high in the mountains, no one do not bear terrible drought, no one suffer for a cause of the safe life in the mountains and on the great lowland territories. And as higher climb archa, as longer become her age and the longer it continue important job to do. Juniper (archa) forests are growing on watersheds. If mountains are the towers and fortress for the water, each tree is the faithful guardsman of it.

They say that to judge about existence of the society, is possible on the existence of the elders. I think that about many mountainous countries we can judge on the existence mountain forests in general and their juniper forests particularly.

The task of this paper - give materials for thinking over of the contemporary position of archa for the 'simple' ecotourists, scientists who is studying or intend to study this excellent plants, to the peoples' who are living in mountains, like them and ready to help to these unique plants, to help themselves.

The Man study many important things, but he do not become proficient with the highest art - the art of the peaceful life. His warlike character appeared during ages in mountains especially. That is why the author decided to attract attention to the role of war in the life of these excellent plants.

We must understand: if archa really 'fatal tree', whose life connected with the war? And what shall we do? The paper is finished with the short tale about amazing man - Alexandr Choub, who show with all his life, how much can do one person only for rebirth of the mountain's nature.

1. Juniper, what is it?

Everybody, who managed to travel in mountains of Central Asia or, for instance, has crossed mountains of the Hindukush, the Caucasus, the North Africa's Atlas, the Pyreneans mountains in France or Spain, the Alps in Italy, or the Rocky Mountains in the USA, for sure they have seen junipers trees at the slopes of these mountains. And some of them used these trees, possibly, as a fuel for their campfire. If so, they couldn't forget that wonderful smell of the juniper's smoke. It is very pleasant coniferous tree. (Order Pinales, Family Cupressaceae), relative of well-known Cuprerssus. Those of you, who have studied or have had to deal with junipers, recognize them as old friends. Others do not have any idea about these plants. Many people have seen junipers on TV with the news about the wars in Afghanistan, Chechnya and in Yugoslavia (Serbia); juniper trees cover the mountain's slopes and are used as a refuge for fighters. The single big tree could give a hide about 10-15 persons.

All of juniper species are unique, because they came to us from immemorial times. Their formation took place in Jurassic period close to 190 million years ago. Besides it they are unique because they are exclusively useful plants. The mountain junipers plants, which we were worked with, are relatives of the modest bushes, growing in northern flat woods.

- *Juniperus communis*, or as the Russian say: 'common juniper', but people of Central Asian republics call it as archa. Archa trees reach sometimes the height of 25 m. or even up to 30 m. Maximal diameter of these giants reaches up to 3 - 5 meters. Their age could come from 2000 to 5000 years, as figure out researchers of the Pakistan wildlife management. The 'monument tree' (*Juniperus foetidissima* Willd.) grows also in Turkey (Anatolia). The age of these trees sometimes reach 600-700 years, the height - 22 m., diameter - 2, 2 m. Tall-trunk trees grow at rather small altitude, on the higher altitude they transform into the spreader form (it concerns species *Juniperus turkestanica* Kom. in Central Asia). In mountains of Kirghizstan such spreaded forms of crowns have another species - J. sibirica Burgsd... Now we are approaching to the juniper tree to begin assessment of its peculiarities. Its tiny twigs are covered with scale-like leaves, but some trees of other species have needle-like leaves. Sometimes needle-like and scale-like leaves likely to meet on the same tree, leaves could have whitish or bluish wax cover. Botanists consider that both types of leaves help plants for saving the water. The young juniper seedlings have the needle-like leaves only. This information used by scientists as a base to consider these mature forms with such leaves as ancestors plants having leaves in the form of scales.

Junipers' variability is really boundless. They have incredible forms of crones. Some of them are similar to majestic, harmonious cypresses, others looks like the disarranged, shaggy and clumsy witches. And crone's colors: light green,

almost black, bluish, golden-yellow, etc. It would be possible to enumerate all those diversities.

Archa has male and female trees. Male trees bear small 'flowers' alike cones, but very small. Female 'flowers' remind small stars, green outside and reddish inside. Each of them contains from 1 to 12 seeds; different species have different number of seeds. Juniper seeds are hidden in fleshy berries. It is better in this case to use the name 'cone-berries', because we should keep in mind that junipers do not have real berries. As the Pinaceous plants they have 'cones'. On the same tree, cone-berries usually have different color: green with a gray film, violet, dark- blue and sparkle black. So, the tree, covered with great quantity of many-colored berries, reminds the cheerful Christmas tree. These original berries rip within two years to what the marked distinctions are connected.

So, I am not here giving you a lecture on the Botany of the genus Juniperus. Our way goes now to the mountain forests. Our main purpose is not only to see these plants, but, first of all, to understand, what is the real value of these junipers or archa forests for the Mankind.

2. Where junipers grow and what names they have?

It seems strange for a first view, but taxonomical mistakes in juniper classification are connected with the wars. The English army was moving across India and it was followed by scientists, they were described and nominate species, new for science (and new plants, naturally). The Russian army conquered Turkistan as well, behind the army there were groups of Russian scientists, who described and nominate new species by their own names. No doubts, that some of that plants species were described twice by different scientists. And we have to deal with number of synonyms. Juniper forests have interesting feature: they do not grow in the Southern Hemisphere (except some parts of East Africa) and surround globe in a kind of wide ring. It coincides with many mountain systems. Junipers are possible to meet not only in mountains, but on plains too. In the South Carolina, for instance, you could see along roads trees of species J. salicicola or 'Pencil cedar' (it was used merely for making pencils). There is rank of species growing in the American mountains (Juniperus virginian, J. mexicana, J. scopulorum and others). The most common tree in plain forest regions of Europe is Juniperus communis, but this species also occurs in the mountains of Western hemisphere and on the North African shores of the Mediterranean, on the slopes of the modest mountains of Scandia. Archa's favorite places to live are located from height of 900 m. up to 4000 m. It is the woody plant's genus having the widest vertical aerial borders. There, where these forests grow, others woody trees usually you could not meet.

Although there are known mixed forests: juniper and an oak, juniper and birches, juniper and pines etc., mountain juniper (archa), is one of the most

unpretentious plants. These trees frequently lodge on naked, inaccessible rocks and expend their life, open to all most severe winds and the ruthless sun. Their saplings are known, growing too high in mountains that precipitation fall there is snow only. For such trees the life is not the life, but only distress, from our point of observation. They vital to the rocks, and grow extraordinary slowly, but can perform their duties century by century.

Juniper's extraordinary long roots keep rocks together even after trees' death. Different species of this tree settle at appropriate ecological niches. In the south-west Kirghizstan, the bottom part of a wood zone occupies Juniperus seravshanica, named so in honor of the river Zeravshan. In higher mountain area - J. semiglobosa obtains its name because of its cone-berries form, and on the top of mountains - J. turkestanica - called in honor of mountain Turkistan territory, where this species was sampled.

Mountain junipers (like their relatives, growing on plains) have, in different countries, a lot of national popular names. Archa - as we know, one of their Asian's names. It has been recognized in the European botanical and forestry literature last time especially. I think that there are some reason to call all representatives of gen. Juniperus - Juniper and to use for the designation of mountain juniper the name archa. The names artsa, arsha, artysh (from Persian 'arsa' - juniper) are used in Kazachstan, South Siberia and Ukraine.

It is of the great interest that mountaineers differ main from their mountains juniper species easy, and gave them special names. So, Kyrghizs perfectly know the tree named kara-archa or 'black archa' (Juni- perus zerawshasnica Kom.), named so in connection with the crown color, saur- archa or 'motley archa' (J. semiglobosa Reg.) and urjuk- archa - apricot juniper (J. turkestanika Kom.), because of sweet cone berries. There are some Indian lokal names for the mountain junipers too. (For instance: shur, chalkai and others). It would be very useful and important to assemble a special dictionary: "National popular and scientific names for different Juniper species of the world". The scientists are faced with the necessity to do great work - to describe areas of all mountain juniper species.

3. What Archa is used for and what is its role in the Nature?

First of all, this tree is a durable, strong construction material, as well as a material for making hand-made articles (crests, bowls, a beads, scoops, mortars, or cradles), a material for manufacturing the best in the world pencils ("Kohinoor", "Faber"), fuel, timber for mines, raw material for burning out charcoal, a source of aromatic substance for perfumes and food processing industry, for incense, a foundation of some medicines and painting substances, and also an immersion oil for microscopes. Juniper is used worldwide. Campfires in mountain nomads' tents are burned by juniper's logs. By the way, its smoke fumigates premises, it is especially important if in the house

somebody was ill or, God forbids, has died. Firewood of mountain elder (the big tree) could serve needs of one family for 5-7 days. It is clear, that archa's extinction is stirring together with the penetration of man to mountains.

I have forgotten that mountaineers use leaves and juniper twigs for smoking. It cleans the mouth. Each tourist should know that a smoke of juniper's bark is a fine medicine for a cold. For treatment it is enough to pick shred of bark and to place it in clean container, with the apertures punched in a cover. Place it on a fire and inhale this wonderful bluish smoke. Next morning you will be healthy.

Juniper berries are wonderful and effective diuretic. Lovers of strong drinks make with it own aromatic gin. For this purpose it is enough to place cut berries in ordinary vodka (better to use for it green, one year-old berries). It is necessary to know that for this purpose it is completely unsuitable to use berries of *Juniperus sabina*. It contains sabinol, which is poisonous.

But the main juniper's importance is determined by its role in mountain ecological systems. This tree occupies *advanced positions* in mountains; it grows on watersheds, in places of formation of many rivers for most arid regions of the world. Archa (juniper) carries out in mountains the following functions:

- As we have already said, juniper is the most precious tree in droughty regions which saves the water, adjusting and regulating its drain. It protects ground from erosion, stores fertility of the soils.
- It is better than any complex technical constructions interfere with occurrence pernicious sills and landslips. - Brakes violent attacks of winds.
- Clears off pathogenic microbes above big territories of the world.
- Gives a refuge to animals and birds (including rather rare species, such as a snow leopard, mountain turkey hen (ular). By the number of rare species, included in the "Red book of Kirghizsytan", its area occupies one of the first places in the world. Kirghizstan is real depository of world's biodiversity.

Besides it:

- Juniper is also your backer that is the benefactor for all tourists. It is the reliable guard of mysterious sacred places which are a lot in mountains' secluded places. Perhaps it covers from mankind mysterious land of Shambala.
- In many places it is a totem-tree, a pray-tree under which you could receive confidence that pilgrims essentially reach ears of Allah or Buddha. At monasteries in India and Tibet there are sacred juniper trees grow, which holiness support all our civilization. They are an essential

cultural element of many mountain peoples - person of legends, fairy tales and poems. In other word, the juniper is a keeper of the life of our Nature and the guard of all main interests of our society. Till now it still provides sustainable development of extensive mountain regions of the world, and also the greatest lowland territories.

I should tell that about tenth part of mankind lives in mountains, about half of world's population drinks the cleanest water from the mountain rivers, which are saved by these trees. Certainly, many other woods save water for people, but Juniperus play advanced role in the struggle for the savings of world life!

4. How many of juniper forests exist on the Earth?

We do not have precise answer for this question. There are some figures on separate territories, but general picture is unknown. The matter is that we have to deal with the forests which hide in inaccessible mountain's gorges, where people never visited. More over, not in all countries we have reliable forest data. But in majority of the world regions Juniper perished under axes.

In former republics of Central Asia there were approximately from 1, 5 to 2, 0 millions hectares of junipers forest, which existed before our October revolution. Between 1949 and 1976 years it was cut 711, 9 thousand hectares. In some states (Uzbekistan, Turkmenia) it was smashed 60-80 % of juniper forests. In Kazakhstan - 98%! Destructive work covers all countries of the world.

How to count our general losses while nobody tried to do it? Completely apocalyptical picture of contemporary conditions of the forests was drawn recently by the President of the Pakistan Ecological Society Mr. Aghast Igrar Haroon in the Internet. It is clear that people operated by a principle: 'What we have, we do not store up'. We have full right to say: our loses are extraordinary big. The Mankind looses the control on processes, in the most parts of mountain juniper forests. But may by I am mistaken?

Let us consider now some citation from papers of different authors. We begin from the data, published in Proceedings International Symposium (Problems of Juniper forests: Looking Solutions, Methods, Techniques (Kirghizstan, 2002).

PAKISTAN: 'Juniper forests cover a major percentage in Northern Areas of Pakistan. In northern Areas of Pakistan this valuable tree species near to its elimination' (Majeed: 52).

INDIA: 'The Ziarat (province of India - Authors remark) forest consist approximately 88000 ha. of nearly pure, open grown stands of Juniperus excelsa. Much of this forest is in degraded condition, due to excessive levels of fuel wood harvesting and overgrazing' (Muhammad: 152).

AFGHANISTAN: The situation in this country is well known. During 23 (23!) years of the terrible wars the nature of the country was practically destroyed, destroyed up to the ground. I shall have remind here that American Army used special bombs for archa's annihilation. The matter of fact is that the single of big tree could give a cover under its crown for the full soldiers' detachment. The forests are the friends for one country since beginning the war and the enemies for other ones. Vietnamese remember how the USA destroyed jungles in many parts of their country. And people of Afghanistan will not forget how Russians and Americans were burning their juniper forests.

TURKEY: 'About 6% of Turkish forested land is covered by juniper forests, (1,234,162 ha), but more than 93% of that forests are degraded (M. Yilmaz cyt. on Konuku, 1999).' It is interesting that two other authors (Omer @ Demirci,112-114) in the same book writes that juniper cover in Turkey 925 822 ha. It is a normal picture when different authors give different figures for one and the same country. It helps understand reasons: why we do not have precise answer on the question how many junipers grows on the Earth.

FRANCE: 'It seems to be in correlation with the human activities in the valley; wood cutting and pasture. The decrease of this last one permits the rapid extension of pines, which endangered the Juniperus thurifera. Another danger, for old population, is the difficult regeneration of the species, observed since more a century (A. Del Cerro Barja at others, 2000). SPAIN: 'The Thuriferous juniper stands from the Campo de Montiel (natural area in the S.E. of Spain) are particularly important due to their large extension (occupying 55,000 ha). Unfortunately, they are in a remarkably poor state of conservation...' One of the reasons of it: ' Land ownership pattern in this area, as 90 % of the land is in private hands'(L. Lathuillere, 2000).

U.S.A. All data concerning United States belongs to W. Ciesla (2002) 'Juniper Forests - a special Challenge for Sustainable Forestry'. 'Over 19 million ha of the southwestern USA are covered with low, open juniper-pine woodlands. Two species of pinion pines; Pinus edulis in Colorado, New Mexico, Arizona and eastern Utah and P. monophylla in Nevada and eastern California occur in mixture with several species of Juniperus'.

By the Lanner's opinion (1981) as Ciesla writes: 'These forests have been under severe pressure from humans since the time of European settlement. During the mid 1800's, when silver was discovered in Nevada, both pinions and junipers provided timbers for shoring mine-shafts, charcoal for smelting ore and fuel wood for cooking and heating. This resulted in the clearing of thousands of hectares of woodland. From 1920s to 1930s, more than 81,000 ha of pinion - juniper were cleared in southwestern Colorado for production of pinto beans '. Many hectares of lands were cleared later 400 000 ha in Arizona in 1950 - 1959, 122 000 ha in Arizona and New Mexico (between 1960 and 1985) (Miller, 1994).

Two tractors connected by ship anchor chain were used for clearing. They drew on parallel tracks and uproot trees in their path. The cleared areas than seeded with crested grass.

The Kirghizian shepherds used to do the same in archa forests. To be more truthful, they do not use tractors, but their purpose was to do bigger their pastures. It took place not long time ago, during soviet times.

I think that given examples taken altogether say quite definitely that the Man lead the 'undeclared wars' with junipers since ancient times. It was and still it is the first kind of wars connected with junipers and all peoples from different countries were conquerors in them.

The Mankind has lost the control over processes proceeding in the most juniper forests. It is involuntarily remembered that even by the Soviet Power in Tajikistan was organized experiment simultaneously estimation of plant resources (including archa) from satellite "Mir" ('Peace') by accurate definition the obtained materials with the ground expeditions. We hope that that experiment will be quickly used, first of all for estimation of the existence of junipers in Afghanistan, for instance. We need in this matter whole scale of an international cooperation.

5. Juniper and the war

Alas, the nature is vindictive. It does not forgive mistakes, and, especially the same ordinary barbarity. And all of us dearly should pay for it. I think, my dear readers, that most of you are far from a politics and if begin to pay any interest to archa, only because to learn more about those territories which, in your opinion, probably it would be interesting to visit as a tourists. Nevertheless, let us look at a map and with a red pencil to mark some points in mountain regions of Northern Hemisphere where either recently has stopped, or continue shooting, where died children of the Earth, where decay charcoal the latent withstand.

Our marks arrange in Northern and South Korea, we shall place them in China and on Tibet, in China and India, India and Pakistan, in Afghanistan and Tajikistan, Tajikistan, Kirghizsytan and Uzbekistan, Iran, Iraq, on Caucasus, in Albania, Serbia and Macedonia, Turkey and Kurdistan, Georgia and Abkhazia, Chechnya, Armenia and Azerbaijan, etc. We receive the bloody ring which it is uneasy to notice; completely will coincide with places where mountain junipers are growing.

What is this? - are they (archa) fatal, bewitched woods are "guilty" that people spill blood in mountains? Certainly is not so, and not all here so is simple, not all of that is unequivocal. Serbs and Albanians divided fertile Kosovo's soils. Iran and Iraq conducted massacre because of petroleum. As concerns Hindustan,

Chine and Pakistan circumstances, it brought them together on a battlefield of a problem of geopolitics, national problems. Reasons for this practice are different. Besides it is time to recollect, that, alongside with junipers, there are in mountains other woods.

In Kirghizia, for example, it is fir groves (Picea tjanshanica) and walnut-fruit forests, and they, certainly, also carry out the basic functions of mountain woods. But let us remember: archa grows on watersheds, it always play the role of avant-garde and it tells us all.

Now we shall look attentively what occur in mountains. Kirghizstan is small mountain republic. Mountains occupy there 94% of territory. Almost similar picture there is in Tajikistan. These states lived long time as good neighbors. And suddenly, on the shores of the river Isfana in 1989 Kirghiz and Uzbeks submit in bloody fight. In a course fight there were stones, sticks... Thank God - has done without victims. But what people were divided for? - They divided water - ordinary water for irrigation, which in droughty mountains, as is known, "worth its weight in gold". It has passed a short time and in that case fight occurred between Tajiks and Uzbeks. The matter is that near city Tursun-Zade - in Tajikistan, on border with Uzbekistan the aluminum factory is located. It was built without taking into account a wind rose and all harmful emission, which spread above the neighbor's grounds. Against it, naturally, Tajiks rose. Victims were from both sides. And to do the air clean had possibility the forest if any.

President of the USSR's Academy of Science, Vladimir Komarov, well-known taxonomist-botanist and traveler, who named many Asian Juniper species, once wrote: "There, where there are no other woods, except for juniper, just these woods belongs outstanding influence on a climate and cultures of the given country". Besides, he insisted that there, where junipers is cut down, stone deserts reach many kilometers. Yes, and in this sense juniper it is valid - a fatal tree. A misfortune is that its destruction - are an event, with inevitability ill fate connected with destruction of natural base of peoples' activity. And terrible process this goes with a "cosmic" speed (inspite the accepted in 1960 prohibitory law forbade cutting of archa).

It is considered, that forests now perish in Amazonia (1% per one year), but I assert, that speed of deforestation on some places of the Central Asia at the present time goes much quickly. Truly, we do not know "what we create". In what jungle has got us with you, the kind amateur of travels, and the same juniper.

Geographers have started to speak about woods, to their ecological role in mountains relatively recently, when having recognized a wood as essential element of ecosystems. They usually by the way speak about a wood in general and didn't use specific names of the trees, quite often the difference between

some forests were completely ignored. But archa in their mountain zone - a wood completely uncommon. It is specificity determines also character "archa's wars".

1. The first war against juniper conducted (as far as we have seen), by people who have appeared with the cattle in mountains. They cut archa for the numerous needs, the cattle trod young trees, regularly beat myriad tracks, rammed ground and shoots complicating occurrence.
2. The second war has arisen then when archa began to be considered as a handicap of development of a mountain pastures. The slogan of it: "The less unuseful archa - the more meadows and pastures".
3. The third war was not actually war for archa. The juniper "was at war" indirectly as the supplier of raw material for the army.
4. The fourth war just develops; it is connected with partisan's stage of fight against taliban, other terrorists in the mountains. It is the war with ruthless guerrilla actions in many mountain regions of the world, connected with special destruction of archa forests. Each war of such type is local, but that also is especially terrible, for in small territories enormous destructive power concentrates. A number of such local wars create the hard position of the contemporary world.

Some researchers, as Prof. Aarun Elchans (1999) from USA are sure, that in Central Asia occurrence of war because of water is quite possible, and you see we shall recollect, that water - those natural resources, to the savings and ennobling of which juniper has the most direct relation. Unfortunately, it is difficult not agree with mister Professor, such war is possible not only theoretically. As less juniper become in mountains, as greater become chance for the beginning of the war.

Barbarous cutting down of woods in mountains Pamiro-Alai has resulted demolition of the main waterways of Central Asia - Amu-Darja and Syr-Darya. The result of that was destruction of Lake Aral which ceased to exist as uniform reservoir. Certainly, all is not so simply and, besides deforestation, played a role set of other factors (nasty irrigational systems for example). But the fact remains that the sea was lost, and on the genetic consequences as experts consider, it is equal to several Chernobyl...

But life proceeds. The President of Uzbekistan Islam Karimov more than once declared, that it is necessary to return to consideration of a question, connected with turning of some northern (i.e. Russian) rivers to the south (to restore the Aral lake). Such well-known democrat in the world, as Kirghiz's writer Chingiz Ajtmatov has expressed similar desire.

However, it is impossible to assume, that Russia will go in this direction.

However our Russian Duma had discussed this problem not long ago quite seriously. It is one of the complicated problems of contemporary relation between Russia and Central Asian Republics.

There are on the earth exist even more worrying projects. Dr. Shirin Akiner (1997) has written: 'Some Tajiks speak of using water as an offensive weapon in any territorial dispute with Uzbekistan. Three ways are suggested: poisoning the rivers (they mean the greatest river of the Republic - Amu-Darja. - My remark: Author), restricting the flow, and opening the sluices (or bursting the dams) to flood the plains". And than Dr. Akiner continue: 'It is unlikely that these threats will actually be realized, not least because they would cause almost as much damage upstream as downstream. However, it is a sobering thought that, with minimal technology, water could be used to inflict almost as much devastation as nuclear bomb'. I hope that there are just only terrible tales and nothing more. But it is important to remember that forest could at the some rate oppose such paranoiac plans.

Here we make sure that the archa's fate was and is connected with the war.

6. What people are going to do with archa?

To answer this question, August, 7-11 2000 in city of OSH *), in South-West Kirghizstasn for the first time in a history of a juniper wood science 120 representatives of 25 countries of the world have gathered **). Have gathered to participate in a symposium: 'Problems of juniper forests: Looking for Solutions, Methods, Techniques'. To come to an important decisions concerning the world juniper forests conservation and restoration, certainly. All these become real because in Kirghizia since 1996 the Kirgiz-Swiss Program Supporting Forestry works (supervisor at that time mister Ueli Mueller). Switzerland also has financed realization fantastic to contemporary Central Asia action. I was the single Russia's representative on the Seminar it seems to me. Perhaps many of Russian's scientists studied and continue to study the plants of genus Juniperus.

I shall not describe details, say only, that in Osh the friends - adherents without effort understanding each other, despite of distinction of languages. Speeches about sad destiny of the world juniper have sounded at the Seminar and many was told about what troubles are waiting the mankind if it will not think suddenly waits and do not take immediate measures for preservation some more available and cultivation of new woods.

The 'Proceedings' of a Symposium published in English and Russian in 2002 serve in the first turn to draw the attention to the juniper problem of wide scientific rounds and I think ecological tourists too. Forces of juniperologists are shattered and the next important purpose - to pool the efforts of all persons working in the field of juniper research, their conservation and restoration.

The themes of reports on the Osh's Seminar where universal: they spoke about juniper seeds harvest, about pests of seeds, ways of juniper cultivation , rational methods of forests management wood and an agriculture in a zone of juniper forests, about secrets of pollination and fertilisation of seeds, introduction of communal conducting forestry in the juniper woods.

The report of M-me Ester Haldimann from Switzerland with colleagues “Potential for Collaborative Forest Management in the Juniper (Archa) Forests of Kyrgyzstan" was very interesting. Authors discuss the question about community forestry. Such way is evidently the only way to reach a turning point in the juniper forests conservation and restoration. The question is: how to take interest to the problems in indigenous people?

Interesting reports where much and about each report it would be possible to write the separate instructive and touching story. Scientists not only reported and argued at the sessions which were taking place in the former House of a Political Propaganda Osh District Kirghiz's Communist Party Committee, but left in mountains, got acquainted with the juniper in Kirghizia, made excursions in a nature with colleagues. And anywhere and everywhere, new and new promising contacts constantly were come into. To tell the truth, these voyages were saddened with a terrorists attack on territory of Kirghizia and Uzbekistan (from Tajikistan). People were killed.

In conclusion of a seminar "brainstorming" of the Juniper Problem was carried out, is made a number of real, business offers. The main thing from them: to remember, that we live on a small planet, on which everyone forester, each tourist, must keep answer for the life fragile mountain ecosystem, to develop them in a sustainable way for benefit of each local population.

Kirgizstan demonstrate the remarkable initiative - organized for the first time in the science history real international seminar on juniper which was welcomed by representatives of many countries. It will give certainly yield the fruits: the new page will appears in the Internet devoted to the juniper woods, and juniperologists of the world will receive remarkable opportunities for cooperation. The Symposium has supported the idea to organize the International Juniper Research Centre. The safing of the network (set up at occasion of the symposium) should be the base of this work.

The Mountain Forum (Electronic Network) has done the great work in this field too and continue to do it. The activity of it constitute the work's kernel of all International Year of Mountains 2002, the centre of which is situated in the Bishkek. The rank of E-mail conferences dedicated to the widest rank of mountain problems all over the world it's enough to remember here. This grandiosity actions takes place practically in all countries having mountains on their territories.

The Conference participants as far as I can judge, have discussed and continue to do it considering all sides of the mountain life (the life of the wild nature, conservation of biodiversity, sustainable development of mountain territories, the life of societies and so on).

The mountain forests attracted naturally serious attention too. All this especially important because the most main decision will be accepted during African Summit Rio+10. (My paper was prepared before Meeting in Johannesburg).

I think that it is important to cite here next idea of Prof. Douglas McGuire (from his e-mail publication 18.04.02.) 'Natural Policies and Institutions for Sustainable Mountain Development'. He has written: "Mountains must constitute distinct entity and recognized as such within this global view. This global approach requires taking into account the development needs of mountain regions and the sustainable management of natural resources'.

We, my reader, certainly understand as modest place occupy among all complicated mountain problems our Juniper Problem (JP). But just at the same time we must understand that verdict concerning junipers now will be valid solution as minimum for the nearest 10 years. Just at the same time we know: juniper must be safed from the full distinction!. That is why I risk invite you to consider some main positions of Conclusions and Recommendations of International Seminar in Osh. I think that it is especially interesting just now because of organization of Juniper Cultivated Forum (JCF).

Juniperologists in Osh have written in particular:

'1. Juniper forests of the world, growing mainly, in arid mountain conditions, are considered as national heritage, play a decisive role for disadvantaged regions, and need to be developed in a sustainable way for the benefit of the local populations...'

'National heritage' are the key words here. Suáh position determine that, the same belonging of the juniper forests to the nation (not to the private persons) proposed that they will develop on the sustainable base only. After this follow appeals to the local citizen, local power, scientists, foresters and lastly to the governments and international organizations to do all depending on them for development of forests for the benefit of the local population. The governments must be guarantors of the juniper forests' conservation and regeneration. But they couldn't do it, as we have seen on the examples of formerly Soviet Asian Republics. We have seen the sad results of such position - deforestation was the single real result of such policy. Result of it - catastrophical, calamitous position of many regions. Archa forests as National heritage require from all people of the country to be proud of their unique forests. It is hard educational task for a long period.

To safe the best available forests, as one of the first steps - are organization of preservations with the statute of the 'World heritage' and appropriation such statute to the best existing preservations. Each such forest reserve will be real school of the careful, solicitous sustainable relation to the juniper's zones in general. Some of new of the Osh Seminar solutions must be used by this work.

For instance it is important:

'... Strong involvement of local authorities, scientists, forest services with the involvement of the local population in decision taking and planning processes, and international assistance aimed at the promotion of multifunctional forestry, with the use of new methods and techniques management, inventory and regeneration of the forests, including the forest health monitoring...'

Let me enumerate here some main scientific questions demanding of the solution. (It seems especially important task now in connection with the beginning of activity of JCF).

1. To state the number of species in the genus Juniperus (50-54-70 ?). This work could do the single high educated taxonomist-ecologist. All materials must be sent to him. He will have the first class taxonomical laboratory.
2. To identify wide circles of different pests of junipers practically not investigated at all or not enough investigated (Insects, Acari, Fungy, parasitic plants). It is necessary to have real "army" of excellent taxonomists- morphologists, specialists in the field of individual development (pests' ontogenesis).
3. To study the life-cycles of main pests for biological base of their control. This work demand the many-years detailed investigations in the Mountains of the World.
4. To understand the reasons of enigmatic swarms of junipers in the rank of countries.
5. To organize long-term observations on the juniper seeds production (their quality and quantity) for it's prognosis elaboration. To do it in all countries having great territories covered with juniper up to this time.
6. To organize selection of the best forms.
7. To study the carriers of juniper seeds.
8. To learn create juniper plantation on the south dry rocky slopes. This list of course can be continued. And it is clear that to border the work of the JCF with the juniper's cultivation only - practically impossible.

But it is not main things. The science not one separately taken poor mountain country, couldn't solve on the enough high scientific and practical level this or that from enumerated complicated juniper problems. The scientific aspects of the JP may be solved by the International Centre for Research and Training on Juniper only. I must remember here that there is such effectively working

Centre for Research and Training on Seabuckthorn. Probably it is expedient for making with junipers organizing analogous centre under FAO aegis. We shall hope that the named action will give new stimulus for cooperation to all countries of the world in business of juniper preservation and restoration.

If peoples of different countries can unit their efforts, it will means that it is possible, that as in the kind old time, crystal jets of the mountain rivers will ring, peace fields will blossom. Will cease to sound from under juniper branches treacherous shots talibs' and other terrorists. Alternative to this - constant intensity in the international relations between many countries, multiplication number of the centers of "cold" and "hot" wars because of water, the grounds, because of defilement of relics... Shells kill not only people - they ruin life in general including life of trees. Still burn down demanding restoration, juniper forests the Chechen Republic and Ingushetia other countries, formerly fine woods of Afghanistan, decay ominous charcoals in mountains of Kosovo and Macedonia.

The soul of everyone forester also hurts: we are responsible for the real rich - natural resources belonging to all Mankind - juniper forests. To us to restore destroyed... Can not, not have rights to flash any new center of war on the sacred Juniper ground, on our entire fine planet! And you be not afraid, dear tourist to choose a route to Central Asia, in Kirghizstan for instance. You see exactly the President of Kirghizia A.Akaev - the big fan of any sort of initiatives, - has declared 2001 as the Tourism Year he initiator of the organization of the International Year of Mountains in 2002. Now he himself has Forestry Management Service in Kirghizstan under his curatorship. It is undoubtedly important step - an example for leaders of the other "juniperous" countries.

The Mankind had possibility methodically and effectively ruins the nature, destroy ecological complexes, the peoples now in the best case only grope approaches to the mountains' rebirth.

The Mankind already stay before the necessity to revival the Afganistan long-suffering earth. American and European technocrats, devoted to the logic of habitual building of satisfactory life, try to stuff a mountains with techniques (micro-hydro-power, the contemporary wind turbines, sun batteries etc.). But, the problems for the solution not are only technical problems, in the first turn it is historical, ethnographical, psychological complex of questions. Everyone knows it: mountaineers' home there where burning hearth home, but not there where cooking on the electric-stove. It is not by accident, as demonstrated passed not long ago Mountain Forum e-mail conference, the electrification not always lead to the diminution of wood consumption, reduce forest cutting.

Exit exists in the revival of the nature life destructed by the war and by our unreasonable activity.

And not forget please where you would not be, where would not burn yours juniper fire, remember: it burns your future, future your children, future of the Mankind, it burns our hope for the mountains sustainable development.

7. Short trip to the Kirghiz mountains

The Central Asia, Kirghizstan. We are in Kichik-Alai, (Small Alai in English) mountains. I like these places very well because exactly here are saved an excellent juniper woods, and local mountains beauty impossible to describe. I like this place because have been working here near to 40 field seasons.

We, formerly Leningradian scientists worked together with our Kirghizian friends in the village Kara-Koi (or Black Sheep - in translation). It is situated on the shore of the river Mazar-Sai. The name of it possible to translate as a "Sacred River". There are living in the summer near to 40 persons, and in the winter only 3.

It's the territory of Archa National Park of Kyrghizstan (single in the Republic special Juniper Park) and territory of Naukat Research Station of Forest and Walnot Institute of Kirghiz National Academy. They are situated side by side.

The Lenin Peak (height 7134 m) is placed not far from there. I was told that to give this mountain new name they shall bring to the mountains the person who gave this odious name for the first time and only this man has the right rename this peak. May it is so may be not... I am sure that that alpinist is died long ago. What it means for the Lenin Peak - I do not know. May be we obliged now to safe this name up to the end of the world. Who knows?.. By the way, President A.Akaev has accomplished ascents not so far from Kara-Koi on the two peaks and named one in honor of Academician Andrey Sakharov and another one - Mariam - in honor of his wife.

From our place up to Chinese border near to 70 km. The nearest small town with the old fortress Daraut-Korgon , is situated in Alai Valley segregated from us with high mountains (in spite of the name "small" Alai). Do not mix, please, this name with Altay it is separate Russian Republic near to Chinese border.

There are no better mountain juniper forest in all Kyrgystan, than MJF in valley Kyrgyz-Ata. This single was inaccessible for the general public for many ages. There was no road upwards, to the forest, since the creation of the world. Automobile rout appears about 30 years ago only. Some secluded valleys do not have roads to our time.

It is possible to say that not seldom we have to deal with the real Virgin Forests.

Kara-Koi is the famous place because just here Kirghizs learnd for the first time to grow archa to receive the first seedlings for artificial juniper forest restoration. It was done by Ukrainian on his nationality, senior researcher of the Forest Institute of National Academie Sciences Republic Kirghizstan Alexandr Choub in 1964. I must add that Alexandr (we were friends) had been working in Kirghizstan near all his life and buried not far from created by him forest introductory plot and the first in Kirghizstan cultivated junipers.

A.Choub in his work pursued two goals: (1) growing mountain-protecting juniper forest plantation, (2) introduction of some rapidly growing woody species into Juniper zone quick-growing species for receiving fuel and wood for building (to prevent Juniper fell). He had grown more than 10 000 000 of excellent seedlings since 1964 up to 1996.

I want you understand: Alexandr V. Choub was real founder of the mountain juniper forest restoration in the Central Asia region. His Juniper plantation, his excellent majestic trees of introduced Picea Schrenkiana, Larix sibirica (the oldest and the highest - near to 30 m), cultivated by him, excellent birches' groves, and introductory plot were the subjects for permanent excursions of specialists, students, party leaders (during Soviet times, naturally) and some "simple" public. President A. Akaev have seen these 'Choub forests', during his trip to "Kyrgyz-Ata". I think that idea to organise 'International Mountain Year was induced at any rate by his visit to the valley Kyrgyz-Ata.

Choub had grown more than 100 ha of junipers. It is not too much naturally. Besides the part of plantations was perished (the reasons of it are not stated). Nevertheless it was a good start to the great deal. It is not a happy accident only that exactly Kyrgyz Republic was the organizer of 'International Juniper Symposium' in the town Osh in 2000. The participants of it twice were the guests in MJF, but they do not see Choub Forests' to my regret. Why they wasn't demonstrated to specialists, I do not know up to the present time.

I have heard not once from very different persons : "Choub's Forest" is the real Miracle of the World! And it is the place for serious thoughtful mood. Choub's experiments can answer on the question: If it is really possible to substitute archa by another quickly-growing trees? The matter is that in some places bearches killed junipers because overshade them.

And now let us talk about more prosaic things. The seeds and berries of all juniper species systematically destroy plantfeeding mites gen. Trisetacus and larvae of some insects. The pests can obliterate near to 90% (!) seeds. That's why the first key element in the creation of the nurseries was receiving of healthy, fertilizated seeds (without pests). Receive the high quality sowing material.

Kirghyz's foresters didn't knew: how to distinguish healthy juniper berries from mites' infested. The only way to know the quality of the seeds was: to do wearing work, to cut great number of berries. We (leningradian biologists) elaborated the quick and reliable method for seeds quality determination (on the place, in forest), without cutting. It was established that affected cone-berries differ from healthy by the presence of originally "small horns" (the seeds ends) projecting over their surface. The normal berries (without mites) were glatt. The government purveyors stopped to accept "horned" cone-berries. The seeds quality essentially grow. And one important information more: we know the smallest part of juniper berries and seeds pests only. We (Entomologists and Acarologists - specialists on the mites) are faced with the investigation of the great number unknown animals in many countries, with the elaboration their control measures.

Our (Petersburg's Acarologists) long-term observations which we continue near to 40 years give possibility to produce for foresters short- and long-years prognosis on the oscillation of berries quantity and fluctuation pest's number on the rank of juniper species. To organize analogous work in different countries having junipers is a very important task.

Afterwords

The mountain peak Kyzyr-Ata (=Kyrghyz-Ata) in the riverhead of Mazar-Sai are the sacral place. The name Kysyr correspondently to Kirghiz's legends was protector of all poor and unhappy people. May be this person can protect all juniper forests too?

I do not know, how many can do a holy, but I have seen with my own eyes what can do the single enthusiast who enamored of the mountains and their excellent forests.

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*) By the way, in October of 2001, the town celebrated 3000 anniversary. So Osh may be older than Roma (it was demonstrated by Russian prof. Juri Zadneprovsky - who is died not long ago).

**) It would be incorrect, do not remember here two previous symposia held during the years of the Soviet Power. The first was organized in Kirghizstan (in the town Jalal-Abad in 1970) and the second in Erevan (Armenia, 1976). I was lucky that have taken part in both of them.

***) Let us remember here that in Spain, for instance, 90% of juniper forests are private.

Notes to readers

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