

# Forest Biocenoses Rehabilitation and Forest Soils Protection Ways

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**Abstract** In the work attitudes to the research carried out on forest biocenosis rehabilitation were clarified. At the same time the necessary protection ways of forest safety were shown due to the responsibilities determined by Kyoto protocol. Accordingly the trees and plants included into the “Red book” of the Republic extended especially in these forests, to secure them new approaches to the forestation is unavoidable. Therefore step by step the responsibilities and the solution ways were exactly presented in this paper. Pursuant to the real situation in Azerbaijan and the amount of the preserves and national parks the development possibilities of the security works have been noticed in the investigation. Finally the suitable protection ways of the forests and the biocenoses within the woodlands were proposed and the guarantee of these ways’ reliability was explained due to the long term monitoring and observations implemented in the innate zones of the Republic.

**Keywords** Biocenosis, Forest, Monitoring, Natural Conservation

## 1. Introduction

From the relief facet 60% territory of the Republic is mountainous and foothill zones where wind and water erosion risk is more than plain and lowlands. Forest strips extended mainly in these zones, that’s why in woodless regions erosion tendency in soil cover exists always. Both water and wind erosions happen in this territory, the major reasons of the erosion is the thinning in forest density and woodless areas on the mountain slopes. Organizing correct ameliorative, agrotechnical [2,9,11,] measurements in foothill zones, protecting forests which regulate hydrological balance correspondingly, realizing reforestation works in time, also preventing forests being cut can accelerate safeguard process. Combat against hazardous impacts making ecological problems is planning proper agrotechnical and hydrotechnical precaution [5,7,10] system in mountain-meadow, mountain-forest cultivation zones in complex form. The soils which were under the forests before, then became woodless area and are being used as grassland, summer, winter grassland have insufficient plant cover to be protected. In order to delay water erosion in these soils plant is to be thoroughly saved and carried out the necessary deeds in the soils undergone the erosion. For reforestation works in such places enriching soil cover consists of the initial stage of the process. By this purpose almost in grasslands pasturage norm is to be followed. Sometimes in woodless

areas during soil investigations morphological changing [1,3,10] of the soil profile is met. This deals with the sedimentations, eroded production washed, then carried by precipitations and steams (sometimes irrigation). Such sediments subsided in the region and reached to the deepest layers. Commonly destruction of the innate plants, incorrect agrotechnical and cultivation works accelerate the erosion process so much, this causes double profile soil generation on the foothill and plain areas. On the horizon variety of forest soil cover profile services picturesque landscape. Especially in mountain-meadow, alpine, subalpine and stepped meadow belts mountain-meadow black soil, rotted-carbonated soils and others extended which is the stepped and meadowed [4,7,8] soil cover consisting of stepped forest-meadow soil subtype in 2000-3500 m from the sea level (partially 1600-3500 m). Surface erosion widely developed in this zone. In some places bed erosion spread on a large scale. In the areas without forest which are used as the summer grassland in spite of the sever erosion process they extended in different regions distributed unequally possessing various territory and development rate. At the result of observations it was revealed that every year beds stretch to 2-2,6 m on the length by causing soil wash. The most developed bed erosion places are situated on mountainous and low foothill sub belts where grey-brown soils extended. After the erosion happened in mountainous regions denudation [3,5,8] but in plains, lowlands accumulation process intensively evolved. Up today for protection of mountainous and foothill forests in majority of the places national parks, preserves, reserves and so on were established. One of the main scope being realized by the very preserves organized in the mountainous regions is to save

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forest belt completely. In spite of existing preserves, national parks the forest destruction risk stays up to and their reduction or complete solution ways should be worked and proposed to the specialists being busy with forestation process.

## 2. Methods and Results

In the investigation work monitoring and analyses of the realized researches have been carried out. observation and monitoring can lead to the further studies in the territory. In order to provide the safety in initially such kind of approach to the investigation is advisable. Forests security supplies the territory by guarantee with the existing ecological risk[6,7,11,] where the woodlands located, so the danger reduces. It is closely connected with the properties on soil protecting and soil enriching by organic matters of the forest. According to the statistics from 2000 to 2007 years amount of the preserves and national parks in order to safeguard biodiversity and to secure effectively the woodlands in the Republic region have been given below at the table. From the table squares and the establishment years of the preserves can be shown.

**Table 1.** Preserves, National Parks in Azerbaijan Republic

Years	2000	2002	2003	2004	2005	2006	2007
Preserves amount	14	14	14	13	13	11	12
Square, thousand ha	192.2	192.2	206.9	200.9	200.9	179.9	179.3
National parks amount	1	1	4	6	7	7	8
Square, thousand ha	0.07	0.07	84.5	117	117.8	233.6	233.6

By the purpose of to interrupt soil degradation and to save biodiversity 12 state nature preserves were established in several parts of the Caucasus and Talish mountains. The main goal of each preserve is to protect natural, endemic valued tree species, plant and animal kinds together. Since 1992 up today Azerbaijan Republic has joint to more than 22 international conventions on environmental safety. Within these conventions different protocols have been signed. In these protocol some responsibilities put forward in front of the Republic to save biogeocenoses in the borders of Azerbaijan. Due to the very protocol and programs broad and fundamental researches are being done in the

Republic. Since 2001 year the Republic has joint to Kyoto Protocol and the document about this was ratified in the Milli Meclis of Azerbaijan. So, in order to save forest strips the following strategical activities are intended in the protocol:

Prevention of forest wood hewing and fuelwood procurement process;

Organization of new reforestation projects and inventory study to learn the current state in the woodlands;

Development and realization of new improving plan on

forestation activities;

Organization of rehabilitation and utilization from forest resources (flora, fauna and so on);

Determination of the influences on the forests during building vacation houses and defining the territory of such forests.

While the monitoring the photos were taken characterizing the current situation of the forest. One of them was given below.



**Figure 1.** The Junction of Forest and Woodless Area

## 3. Results and Discussions

For assessment of forest soils status in the Republic various works, monitoring, soil analyses were realized by different Azerbaijan scientists, at the end the fundamental scientific base was founded. At present researches on ecological estimation of the soils are being carried out in all countries of the world. That's why appreciation of soils has been established on the basis of the fundamental system. And each soil investigation is implemented to this system. In the agriculture field soil assessment can be realized by this method, too. Almost the ecological appreciation of soils under the vegetables like that in various regions have been done by the soil scientists and researchers. The investigations fulfilled in the forests validate that because of illegal forest resource exploitation unwilling change happens in soil structure in woodless areas.

Therefore the new ways and methods for controlling and appreciating forest ecological safety have great importance. Though assessment coefficients on the variation, biological modification, physical, chemical properties of soils have been determined for along time, now all three indexes underwent to the bad condition at the result of ecological hazardous influences.

The all these mentioned responsibilities are the major demands put forward in front of forest industry in the Republic. Due to the international norms and standards the woodland areas should be increased to reach to 25-30% of the total square of the Republic. Because the existing forest square is getting to be reduced. At the end this leads to step fields and desertified lands. Obstruction of such

hazardous and adverse situations is realized by these combating methods within the national programs and international conventions:

Registration of fields undergone to the desertification fields initially;

Development and realization of National Activation Plan against desertification;

Increasing the efficiency of precautions against desertification, establishment of the system on enlightenment in this field;

Application of proper arrangements against desertification;

Correct estimation of the negative impacts made by the ecological problems;

Correct selection of tree kinds for the natural condition while foresting;

Realization of periodical planting in the woodless areas.

## 4. Conclusions

As the major reasons undesired attitude to the environment, utilization of innate resources due to the human's wish can be shown. Reduction of the natural reserves may lead to changing and hazardous impacts in the ecosystem. Sometimes to solve the current problem is either impossible or the solution of the question demands too long time. Only by the presented ways the forestation processes can be rightly directed and may be effective because of the results. The major of them are:

Application of new recultivation processes in forestation and reforestation;

Solution of energy provision demand in the settlements around the woodlands;

Growing necessary rapid developing tree kinds for furniture and building sector;

Organization of Periodical activities to combat against disease and straws;

According to the above mentioned final factors new method for forest ecological estimation has been developed in first time. Ecological clean and economical benefit alternative of the forest wood is able to make easier the situation. Study of the local solar and wind energy potentials and formation database consists of the initial stage of the procedure. Application of these energy potentials in individual houses, schools, kinder gardens and so on in the mountainous and foothill regions around woodland instead of fuelwood from forests can reduce

anthropogenic impact to the forests. Woodlands are so necessary for human life to be supplied with oxygen and row

material for several industry fields. Therefore forest safety services directly to mankind development and peaceful or non hazardous life. Today green energy and green environment matter is the major mission in everywhere including environmental security

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