THE ROMANIAN ECOSYSTEM FOREST – A RECREATION SPACE IN SYLVOTOURISM

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Abstract: *Without the forest, our living environment in the current structure and configuration would be unthinkable. More than other forms of forest vegetation contributed both to the formation of this environment and to maintain it in good functional condition due to favourable life. The main areas of concern mediogene influence both the atmosphere (climate) and soil, and may be summarized as follows: plant producing oxygen, carbon storage in the wood (or other vegetable), regulating the water cycle on Earth, obstacle soil erosion remedy against pollution, climate moderator, home to millions of living things (plants and animals, soil, litter and atmospheric environment), a source of physical and mental health (disconnection, silence). The Romanian forest possesses the highest degree but they are general and common features of any forest right up, because of its great vertical development (we have large forests, old, particularly with eco-protected potential).*

Key words: *ecosystem, tourism, air, sylvotourism, forest, atmosphere*

INTRODUCTION

Forest is more than a community of trees; it is a sacred space that puts man in connection with the demiurgic forces of the cosmos, myths and fairy tales of childhood, offering beauty, tranquillity, peace of mind and patronizing nature retreat away from the noise and hubbub of modern urban overstressed life (7). Disconnecting, forest recreation offered is one of the most effective ways to fight alienation and spiritual recovery forces lost or depleted, helping where other therapeutic means are insufficient. But in point of physical contact with forest man wins.

It is known that forest air is cleaner, richer in oxygen and negative ions loaded, making it more conducive to health, increasing its curative qualities. For example, in one m³ of air in the wood are 0.6 to 2.5 thousands of negative ions, as opposed to the open field, where the concentration thereof decreases 25 times. And this concentration is less crowded centres (cities) and enclosed (decrease up to 100 times).

Conversely, following an exponential curve in cities increases the concentration of harmful bacteria in the forest because of the trees emanating fytoncides almost totally destroyed. A good example (9) is in Paris (in congested areas), where there are over 500 000 bacterii/m³ in August, while the nearby Fontainebleau forest, the concentration does not exceed 50-55 thousands/m³ (3).

It is also important antiphonal function. A forested area of zoning is strong acoustic screens, anti-noise, which contributes substantially to mitigate noise. The silence of the forest, fresh air, beautiful scenery and pleasant climate are diverse and forest attributes that has a positive influences on human health, both sick and healthy. Without forests we are poor, spiritually and physically, because forests are true factories health and environmental pillars of our life in optimal operating condition.

MATERIAL AND METHOD

Each year, every hectare forest stores up to 1.5 tones of CO_2 and release 1.1 tones of O_2, which represents 4 times more per hectare of crop, and 20 times more than one hectare of water surface (lake, sea, and ocean). Extended to the whole country, these figures lead to the following values (1): $12.5 \cdot 10^7$ t CO_2/year and $9.6 \cdot 10^7$ t O_2/year. The most productive teams with over 50% of total the spruce forests and beech forests, due to both growth and higher areas that they occupy (5).

For the production of $1m^3$ of organic matter, the trees stores consumes about 1.8t of dioxide carbon and releases about 1.3t molecular oxygen (8), being necessary the requiring filtering (processing) the purpose of 1.4 million m^3 air.

Under normal growing season, 3-5 medium sized trees (about 25 m tall) can provide all the necessary oxygen they breathe a man throughout the year (including winter when the tree is physiological resting). Equally, are annihilated by photosynthesis and its CO^2 emissions no longer spread in the atmosphere, but are fixed in plant substances.

The same effect processing is the shaft and the other channel loss (consumption) of oxygen, such as internal combustion engines. We know that a car, covering 1000 km of road consumes all the oxygen needed a man to breathe in a year. This oxygen will be replaced by the physiological activity of only 3-5 normal trees growing.

Unfortunately, due to excessive industrialization and energy systems based mostly on consumption of fossil fuels, the concentration of CO^2 in the atmosphere has increased and continues to grow apace, contributing to increased greenhouse effect and thus global warming climate phenomenon that underlying ecological crisis affecting the entire biosphere (mankind).

Thus, according to data from the literature (6), during the last five decades, the concentration of this compound increased by 67 ppm, 317 ppm in 1955 to 356 ppm in 1990, 384 ppm in 2005 and 398 ppm in 2013, the trend being growing (Fig.1). It is estimated that over two decades only CO^2 concentration will exceed the threshold of 430 ppm, which would be disastrous for the climate, but not for the plants, for which the concentration is far from being exhaustive. It does not follow, however, that the plants will not be affected in any way; on the contrary, it is expected that higher survival crisis to occur in the future because of climate will become increasingly unfavourable impact will occur only indirectly.

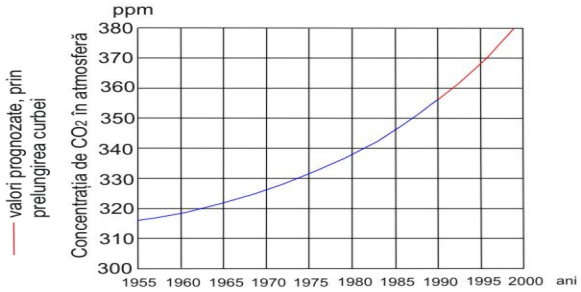

Fig. 1: CO^2 concentration from terrestrial atmosphere

A fact to be noted is that the air in the forest is incomparably cleaner, more oxygenated than the cities and at the same time, rich in negative ions, which positively influence the health of people. Being an open biological system, the ecosystem forest is the regulator the safest and the most important of the CO ratio, of crucial importance for the regeneration of life. Forest must therefore not only appreciate by the economic benefits they bring us, but especially for its environmental quality.

The degree of development, the forest can be seen in two ways: either as a massive presence in the landscape, specific printing large forest areas (geographical sense) or as green islands with some specific climate, a low wooded area or desert (ecoclimatic sense). More than other types of ecosystems, forest influences the space it occupies, making it and shaping it according to its own needs. The changes concern both soil and indoor atmosphere, which received new features specific microclimate becomes Scotch or forestry. They shall be otherwise than out of the forest, particularly in terms of heat showing deviations from the described field, meaning extreme moderation and change values: maximum temperature lower by 3-5˚ C higher minimum 2-3˚ C, less light (in extreme cases, the woodland shade species relative illumination - the amount of light to the open field - can be lowered to 2%), higher atmospheric humidity by 10-20 percentage points, rainfall less (due to canopy interception, equal to 11-40% - according to species and type of wood), wind less attenuated in proportion of 1:5-7, lower evaporation, a.s.o.

Indoor climate of the forest, as we have seen much different from the outside, is explained by the influence that the trees in the community (the population constituted) active climate exerts on surfaces. Due to the large height, they include and modify a large amount of air, affecting both its own climate, internal and general climate (planetary), which becomes more moderate, less excessive. The atmosphere inside is very changing composition and structure. The forest becomes along the ocean, the most important regulator of atmospheric composition on Earth ().

Reduces turbulence and wind speed decreases. Under these conditions the atmosphere quiet suspension filing particulates intensifies, and the role of forest buffer against harm increases. In the edaphically sense, additionally the pedogenesis function, the forest has an important function: pedo-protection. This occurs through runoff braking and stopping or reducing displacement of soil particles by rainfall, because of a buffer layer. This dampens mechanical force, destructive waters.

Despite technical advances man has not yet emerged from the ground, but lives and procure almost all goods only life in the soil. From this point of view we can consider erosion, respectively sealing subsistence economic base as soil catabolism as training and placing it in its productive cycle is anabolism (2). Usually when we talk about erosion, we refer to accelerated erosion caused by water flow on slopes, in the absence of an effective particle washing buffer and damping action of raindrops. It is known shock effect of heavy rain on the size of the water droplets may reach up to 4-6 mm in diameter revealed striking the ground at a speed of 10 m/s. A downpour of 50 mm/h can spread up to 250 tons of soil/ha (4), involving him in down the slope. We can observe here the great importance of the existence of buffer layers between the ground and the rain drops, which is given in the forest litter. It is actually well documented that a well-groomed natural grassland soil protects better than a crop, and this in turn is less efficient than a forest canopy which in addition also has a compact and continuous layer of leaves dead litter the ground (leaf, litter) (8).

Unfortunately, pushed by hunger for land, cleared and grubbed man still making them huge wooded pasture and arable land, less effective, with lower homeostasis erosion. Applying an erosion rate of 0.5% per year can be calculated that, in addition to the existing 600-700 million hectares in the next decade accelerated erosion will conquer the Earth about 50 million ha of agricultural land, which is about half of the world's arable land.

Typological and functional are two types of erosion:

a. slow erosion and tolerance, which has little value and is equal in equilibrium with soil formation rate (below 1t/year/ha);

b. accelerated erosion caused by heavy rains on soils without plant protection (forest), which can reach astronomical values (100t/yeah/ha). This affects the way the erosion of the soil in depth, and may be as substrate.

Currently and progressive grooves formed by erosion, gullies (depth 0.2-2.0 m) and behind ravines (depth 2-10 m). In their case is total destruction and soil washing and collecting works without irreversible. A single rain can destroy in a few hours what nature has created for several centuries.

RESULTS AND DISCUSSIONS

The effects of substances emitted by industry and other human activities on the biosphere, primarily on vegetation, are varied and cover all levels of organization of living matter. (7) They consist in producing cellular damage and tissue metabolism and growth, drying plants, species extinction, soil degradation, water contamination, different environmental failures lacking biotic is reduced to the status of primary lunar landscape. Under this presents great analogies pollution desertification, this helps her work, or proceeds. (1)

Vegetation is the first and most precious victim of pollution, being the primary producer of organic matter and the universal cosmic energy absorber. Obviously, the forest is not exempt from such effects; on the contrary, with long life so long exposure will react stronger. Like any living organism it can withstand a certain degree of pollution, as long as its tolerance limits are exceeded; beyond that it suffers and dies, leaving the place of desolation (3). The main pollutants that endanger the life of the forest are sulphur and its compounds, combinations of fluoride, arsenic compounds of nitrogen, phosphorus, organic matter acid vulnerable radioactive emanations, a.s.o. Herbicides can have serious consequences, which, while stopping the invasion of harmful insects, favouring the development of others and destroy soil organisms and litter, the decisive role in decomposition of organic matter. Therefore, in the last period, people renounced the chemical control, this procedure being gradually replaced by biological or integrated methods.

The most significant form of pollution that decimated thousands of hectares of forest in Central European countries, and in our country is acid rain. Combined with drought, it may have catastrophic effects on the forest (4). Within certain limits and certain pollutants to forest has an important role to combat, or at least to mitigate the pollution. The forest retains its leaves and on stems and branches, large quantities of sulphur dioxide, which as we know generates acid rain (6): lead compounds, very harmful to human health are trees also detained by absorption in leaves (8); is very efficient in forest vegetation and toxic emanations for the exhaust.

The effect of the filter of the harm forest, primarily of the powders is higher than in any other vegetation. It is estimated that 1 ha of deciduous forest normal retinal structure annually 580-600 kg of powder, and one of coniferous canopy with compact, double the amount. Extended to a life time of 25 years, these values corresponds to 15 to 32 t/ha, respectively deciduous and coniferous. While retaining less than coniferous broad leaved have the advantage of "clean exhaust" every year because of the fall leaves. But the forest has a well defined role: it contributes to the treatment of groundwater contaminant loaded due to biological filter function that has litter and soil stratification, structure, porosity, aeration, humus, fine particles intense microbial life.

CONCLUSIONS

Nowadays, the Global forest policy and the national one pass through the great transformations because of the crisis in which we find ourselves and the human inability to stop or even to slow global warming that threatens us. The forest is seen in this fight as a remedy as a means of influencing the circuit of CO, or other substances with a screen to

reflected solar radiation, which is why it should be preserved, enhanced and extended as far as possible. Current interest in the forest is not primarily economic, but ecological.

However, as mentioned, global forests cut (destroy) and will be cut further because mankind is not able, or not prepared to resolve the crisis of industrial wood by upgrading and replacing it other materials. In addition, less developed countries in warmer areas of the world turn to the forest as their only means of subsistence. The problem is not only ecological forests; it thus has a strong economic footprint.

At this juncture, the entire functional regression ecosphere efforts to save forests are great. We mention the most important:

- To save the habitats and species threatened or endangered expected extension of parks and reserved areas (protected) at least 10 % of each country's forest heritage.

- Monitoring of the environment and forest vegetation nationally and globally.

- Stopping and rational exploitation of forest degradation (uncontrolled logging) by the action became mandatory in the European Union "forest certification" refusal to sell the wood comes from forests not free operation. Forests excluded, the cuts are prohibited, so reserved, are those with high ecological value, carrying six basic criteria: contain rare, endemic or endangered; fulfil a particular EcoProtect (climatic, edaphically, hierologically); conserved landscapes of unique beauty and value; important in the defence of erosion of rocks and karsts type relief; presents the cultural and historical value, expresses a particular nationality; are the sole source of income locally.

- Improve all degraded lands with forest vegetation and other biotechnical means. In Romania these lands are concentrated mostly in the agricultural sector (over 2 million ha).

REFERENCES

1. **CHISĂLIŢĂ, I., MOATĂR, M. M., ŞTEFAN, C.:** Administration reform and restructuring state forests, Scientific papers Farm Management, Series I, Vol XII (2), pp 283-286, 2010.
2. **CHISĂLIŢĂ, I.:** Forestry, Editura Eurobit, Timişoara, pp 194-214, 2011.
3. **CRĂCIUNESCU, A.:** Ecological reconstruction of degraded lands locared in the Western Plain of Arad County. Jornal of Academic Days in Arad, pp 45-48, 2003.
4. **CRĂCIUNESCU, A.:** Forests and drought implication, Technical workshop on prevention drought in the Balkans, Poiana Braşov, 2004, pp.23-25.
5. **CUREC, C., MARTIN, S., TABĂRĂ, V.:** Food, feed and green energy: premise for the sustainable agriculture toward transnational network of rural solidarity, XXXIII Conferenza scientifica annuale AISRe, Roma, Instituzioni, Reti Territoriali e Sistema Paese: La governance delle relazioni locali-nazionali, Italy, pp 22-32, 2012.
6. **MOATĂR, M., LĂZUREANU, A.:** Research on the production arrangement applied Steierdorf Unit III. Journal of Horticulture, Forestry and Biotechnology, USAMVB Timisoara, Vol. XIV (3), Ed. Agroprint Timişoara, pp 164-167, 2010
7. **MOATĂR MARIA MIHAELA, STANCIU SORIN, CIOLAC RAMONA, ŞTEFAN CAROLINA AND RUJESCU CIPRIAN:** Water consumption by forest vegetation used for restoration of degraded land, J.Food, Agriculture & Environment, 11(3&4), pp 2849-2853, 2013.
8. **STANCIU, S., TABĂRĂ, AMÂNAR C.:** Elements of law compared forest research and specific procedural rules forest crime, Scientific Papers, Farm Management, USAMVB, Timişoara, USAMVB, Timişoara, Series I, vol XIV, pp 97-100, 2011.
9. **STANCIU, S., TABĂRĂ-AMÂNAR C.:** Integrating Environment into Agriculture and Forestry, Scientific Papers, Series Agronomy, Durable Agriculture in the context of environmental changes, Faculty of Agriculture, USAMV „Ion Ionescu de la Brad", vol. 51, pp 22-30, 2008.