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Environmental Services of Forest Ecosystems - the Czech Republic Case

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Abstract

The paper presented offers a basic information on situation related to ecosystem services that are ensured by forests in the Czech Republic. Presented information concerns particularly water as a general precondition of life. There are included also some basic general information on Czech forestry and added some notes to the respective legislation.

An understanding of the importance of forests for water conservation, water regimen and environment of cultural landscape by the forestry sciences is described. It includes also description of a base for practical forestry "non-productive" activities creation, which has the character of services in relation of forests and water with utilisation of results and records gained on the experimental plots of joint research projects of bioclimatologic, hydropedologic and silvicultural character. There are described principle findings of systematic research work. Possibilities and necessity of payments for ecosystem services PES are mentioned as well as new issues, which requires to be solved for theirs real introduction.

National Forestry Programme (NFP) as intended basis to the new amendment of policy and legislation in the Czech Republic. However in the concurrency of ecological ideas and real economic calculations the former results of research was not taken into account and current NFP does not include the transformation of forestry on the integral sector of forest production and silvicultural services. Thus the bases for development of concrete silvicultural services or PES currently are not included in the NFP and under the current status of forestry policy it is impossible to expect that ecosystem services or publicly beneficial forest functions should be supported by forest legislation in some substantial way. The Act on Nature and Landscape Protection is mentioned as well as the new design of Forest Act, which is under the preparation.

There are noted main related problems including bad medial presentation of forestry, friction among environmental and forestry departments and consequent weakening of forestry sector position and urgent need to improve various laws related to forests and forestry, which could and should concern also such issues like payments for ecosystems services. It is necessary

to stress that solutions of many forest-related problems in the Czech Republic lie outside the forestry sector. Consequently it is necessary to underline the cross-sectoral responsibility for forests and forestry issues. There is a need of political will to solve related problems on a conceptual basis and with respect to all stakeholders and related agreements.

Key words: forest services, non-productive functions, and spontaneous effects of forest ecosystems, cross-sectoral responsibility for forests, lack of political will.

Introduction

The Czech Republic, in terms of area, is one of the smaller states in Europe but it can be proud of its highly diverse natural wealth. Forests are undoubtedly one of the most valuable of its assets - their value can be expressed by purely economic indicators, but the true significance of forests far exceeds their economic importance. Since a long time ago, forest itself has played an important role in the life of human beings as well as in the life of the whole human society. People were getting wood in it for building their homes, wood served people as fuel as well as for other purposes. Also, forests provided other products and many other benefits, which we know also today. First and foremost, it is necessary to refer to their ecological significance – forests as a water reservoir and climate stabiliser, and their aesthetic and recreational significance. Forests constitute a part of our cultural environment, the framework of our home, and thus have a significant psychological and emotional dimension. It is therefore natural that current efforts to protect forests demand a comprehensive, all-round and intense approach.

There are more and more discussions about forests and water in the last years. International community probably feels that an enormous value of both these components, being important in the past as well as at present for the whole human society, should be recognised in more meaningful way. We can consider particularly mountain forest a common, unifying element of both above-mentioned components. Mountains represent an important area, apart from other things, an area providing a source of drinking water, other renewable or not-renewable raw materials and energy. Also, they often represent – as in case of our country – an important natural boundary and barrier, possibly a source of cultural and spiritual traditions of local citizens, and it is the fact that people have obtained and still obtain many benefits from mountain ecosystems. However, up to the present, they in most cases took care much less of their management in the way ensuring their sustainable use and benefit.

Forests play also an important role in hydrological cycle, through the flows originating in them they represent a reservoir of water for agriculture as well as for industry. It is a fact that just here water is able to rotate turbines in the most efficient way providing energy and heat for remote homes. A multi-purpose of particularly mountain forests is given also by their function in maintaining biological variability, protection against natural risks as for example avalanches, land slide and rock fall, erosion, and last not least, climate influencing. In addition, mountains themselves, creating a barrier to moving air masses, represent a place with a higher volume of precipitation. Their importance for water supply and distribution in our country is stressed in the statement of several mountain regions for the Protected Areas of Natural Accumulation of Water.

A hydrologic function of forests is often discussed in our country in the last years, not only with regard to the ability to retain water in the form of snow, possibly in the form of ice with a delayed runoff to lowlands till vegetation period. It was mostly with regard to an assumed relationship between the origin of flooding (floods in 1997 and 2002) and clear felling forest management. Nevertheless, studies confirmed also by the findings of our research institutes, suggested that flooding is necessarily a consequence of some extreme, really catastrophic

precipitations whether or not forests are cut down or tended in any other possible way. A relationship between deforestation and an increased water runoff from mountain basins is much more complex and complicated.

Currently the State Enterprise Forests of the Czech Republic (LCR), administers nearly 20 thousands kilometres of small water flows. It concerns especially mountain streams, torrents that are at the state of a potential erosion endangerment and a damage resulting from it to the forests and properties in a particular stream basin. For a safe diverting of flooding water volumes from mountain streams, it is necessary to take biological, biotechnological and construction-technical measures. These measures are covered by Regional Administrations of Streams of LCR by carrying out an order financed from the state budget as it concerns a fulfilment of function in public interest. Apart from this activity, a task of water flow administrators is to carry out monitoring of water quality.

Czech forestry sector in brief

Forest area	1,000 ha	2,646	Annual fellings - total	mill. m ³	15.60
Forest cover percentage	%	34	- coniferous		13.92
Number of inhabitants	1,000	10,220.6	- broadleaved		1.68
Forest ownership - state	(%)	60.0	- per capita	m ³	1.53
- municipalities		15.4	- per 1 ha of forest		5.90
- other public (schools, regions)		0.5	Salvage fellings	mill. m ³	5.37
- private		23.1	Total growing stock volume	mill. m ³	657.6
- forest co-operatives		1.0	Total mean increment	mill. m ³	17.2
Forest regeneration - natural	ha	18,618	Dtto per 1 ha	m ³ / ha	6.6
- artificial		3,401	Employees in forestry sector	1,000	24
Tending - cleanings	ha	43.400	Species composition - conifers	%	75.5
- thinnings		92.100	- broadleaved		23.4

- Average stock volume on 1 ha of forest lots is 248.7 m³.
- The Forest Management Institute finishes the field data collection in terms of forest inventory 2001-2004 first cycle in 2004 and the forest inventory came into the phase of obtained data processing in 2005.
- Economic situation of forest owner in terms of forest management and with pertinent adjacent activities is, with the exception of the state forests, further worsen. Particularly the decrease in timber prices of timber in rough influenced the economy of entrepreneurial subjects substantially.
- Number of employees in forestry activities in physical persons in entrepreneurial companies and non-entrepreneurial sphere has been downsized again and this trend continues since 1989.
- Activities related to amelioration and torrent control in public interest were supported by 56.9 mill. CZK (ca 1.9 mill. EUR). Because of limited possibilities of the state budget there weren't met all requirements and those unsatisfied were postponed to 2005. In the frame of these provisions there were regulated 14 kilometres of torrents, created flood pools, which have 8,000 m³ of the total retentive capacity of water. Amelioration of forest lots from state subsidies was not performed.
- Afforestation of agricultural land is newly co-financed from the structural funds of the European Union since 2004. It is provided according to the Governmental Order No. 308/2004 Coll., about laying down of conditions for grants administration related to

agricultural land afforestation and on founding of fast growing tree species stands on agricultural land designed for energetic usage.

Over the last decade, Czech Republic as many nations in Central and Eastern Europe (CEE) have experienced a profound transformation or transition of their economies, from the central planning approach of communist regimes to a market-oriented approach. These changes are not only economic, but also encompass the political and social spectrum. The transition continues to have substantial impact on virtually all aspects of life in these nations, including forestry. In the 1990's, the ownership of forested land experienced a dramatic shift in most of these "countries in transition" (CINT). The trend towards nationalization and central planning experienced in the wake of World War II has been largely reversed, tending towards privatization, reduction of state influence, and a shift towards a market economy and pluralism. The goal of this economic liberalization was to stimulate economic growth and improve standards of living. Although these goals are still realistic, and there are some tangible improvements, the overall transition continues to cause substantial economic hardship.

Political liberalisation and democratisation in CINT and global processes has resulted in greatly increased public participation in forestry issues, nevertheless the appropriate awareness is still lacking. But relatively restricted and closed community of forestry professionals and traditionally conservative society must now open up to wider public discussion. Overall, the public is demanding more information and a greater role in decision-making in forestry. Furthermore, the increasing and oftentimes substantial private forest ownership is also forcing more openness in the forestry sector. The private forestry sector and NGOs should perform a valuable watchdog role as they scrutinise the actions of state forestry administrations. Another point - forestry institutions, not only those focused on research, must now face increasing competition from national and international sources. However, currently new forest owners (mostly small ones) have many problems of their own and are not very interested e.g. in funding of research activities.

National forest program, forestry policy and legislation in brief

National Forest Programme has been prepared in a harmony with the ongoing policy discussion on forestry issues on European level.

Currently the first phase of the NFP 2003-2006 is step by step implemented the Czech Republic. For solution of series of particular tasks of the NFP, there were expert reviews elaborated that are just assessed by ministries involved (Ministry of Agriculture, Ministry of Environment).

Preparatory works on the amendment of NFP for the period 2007-2013 has already began, too. It is supposed that the main chapters of the next NFP will be dedicated to the following issues:

- Contemporary forests and Czech forestry (weak points and risks, strengths, gaps and opportunities);
- Vision for forests and forestry up to 2013 and 2020;
- Main targets in several principal circles: - integrated forest management (including forest biodiversity in general); - functionally differentiated forest management oriented e.g. on nature protection, protection of water and soil and recreation function of forest; - forest protection; - economic viability of forest sector; - support of domestic processing of wood, - institutes and institutions;

- Support of forest management from the EAFRD, co-ordination of backing from national sources;
- Pan-European criteria and indicators of sustainable forest management;
- Forestry development regional programmes.

In connection with following issue should be also mentioned that National Forestry Programme (NFP) as intended basis to the new amendment of policy and legislation in the Czech Republic has been proposed already in the beginning of 90ties (Sept. 1993). Originally prepared by NGO (National Forestry Committee - this organisation has been merged with the Czech Forestry Association in the end of August 2005) and then passed by Departments of agriculture and environment. However in the concurrence of ecological ideas and real economic calculations the former results of research was not taken into account and current NFP does not include the transformation of forestry on the integral sector of forest production and silvicultural services. Thus the bases for development of concrete silvicultural services or PES currently are not included in the NFP.

It is supposed that NFP will follow ideas of currently prepared the Forest Action Plan (FAP), which should include formulation of strategic aims particularly in following areas: biodiversity, forest protection, non-productive forest functions and benefits, usage of wood, economic viability of forest sector including non-wood goods and services. We propose to fix an explicit term to refer to the vision and long term strategic aims and we recommend the year 2020. Another proposal concerns the time defining of the FAP, resp. of its concrete objectives. Our recommendation is a period 2007-2013, accordingly with the force of currently prepared regulation of the Council on support of rural development. It is our believe, that possibly there will be cases of purposeful and efficient combining of FAP targets with activities that will be supported from the EAFRD. As regards of indicators for the assessment of FAP implementation, we recommend the usage of Pan-European indicators of sustainable forest management as agreed in MCPFE in Vienna.

Amendment of the Forest Act is supposed in the National Forest Programme (January 2003) - postponed from 2000, but first of all there is a need to complete the restitution process in forestry. The organisational changes including abolition of "forestry branch" as a sector in March 2004 postponed the whole process. After one year of silence the new leadership of Forestry Department reported new ideas on March 22, 2005. It has been confirmed that Forestry Department prefers the preparation of new design of Forest Act proposal than the amendment of current law.

Ecosystem services

The issue of "payments for ecosystem services" (here-in-after PES) concept was a topic of international meeting held in October 2005 in Geneve and it is definitely concerned clearly to the inter-linkage of forests and water. Unfortunately such concept is not known in our country in the area of "non-productive forest functions". Such services in fact do not exist in the Czech Republic. The reason is that in forestry sector was not - up to data - a political will

- to acknowledge services as an indisputable part of silvicultural activities in terms of economic system of forestry,
- to deal with internalisation of forest services in competent state agencies,
- to create the political presumptions and consequently legal background for such services in forest legislation.

Only when these conditions are changed, then it is possible to think about the marketing of forest (silvicultural) services and obtain the appropriate interest on them.

A conception of "payments for ecosystem services" is a crucial issue. Respective forestry research abroad and also in our country elucidated indeed long ago, that in a given point of civilisation development these *spontaneous effects frequently are wanting in real needs of environmental and social effects*. It is necessary to spend manpower and capital to the maintenance and improvement (event. also formation) of concrete positive effects and to inhibition of negative ones. Thus silvicultural services are originated by exploitation of "ecosystem services". There are some believes that forest (particularly natural or close-to-nature one) will offer all environmental services without any silvicultural intervention. This opinion can be likeable to some economists - the forest arranges everything without any deposit of energy, material and capital... but reality is quite another.

As a historical remainder of silvicultural services so called Forestry Amelioration Service with the Torrent Control Service (LTM-HB) survives in the Czech Republic. It was originally assumed from France in the time of Austrian-Hungarian Empire in eighties of 19th century (Austro-Hungarian Imperial Code No. 117/1884). This service represents a public beneficial service of state administration to the protection of cultural landscape against the water.

The importance of forests for water conservation, water regimen and environment of cultural landscape has been understand by the forestry sciences in the territory of what is known as the Czech Republic already in the first third of 20th century. Long-term - several decades - measurements of forest-hydrological research on mountain catchments in the Javorniky Mts. since 1928, further research on experimental watersheds in Beskydy Mts. running already a half of the century etc. There was created a base for practical silvicultural "non-productive" activities having the character of services in relation of forests and water with utilisation of results and records gained on the experimental plots of join research projects of bioclimatologic, hydropedologic and silvicultural character.

Groundwork for real silvicultural activities, which have a character of silvicultural services in the water (water sources) and landscape conservation against the water was since the 70ties of the last century intensely studying in a big projects by forest research in uplands and hilly regions. After the 15 years of systematic work there were obtained the following principle findings:

- Characteristics of the fundamental types of forest functions in conservation of water regimen and cultural landscape: Hydric functions (spontaneous forest effects) and water management functions (aimed effects, called by introduction of work and capital) as different policy-economic components of forestry sector activities - joint effect of forest production and silvicultural services;
- Characteristics of the fundamental types of water management functions (qualitative, quantitative and complex functions),
- Characteristics of the fundamental types of forest stands important from the water management point of view and their dislocation in the Czech Republic. Particularly of forests in the protective zones of water sources (surface basins) for water supply with complex water function (10 %) and important mountain forests (16 % of total forest area);
- Technologies of multipurpose forest management in protective zones of water sources (screening of quality and quantity of dispensable water), according to several functional groups of forest stands (water protection function, antierosive, infiltration, or related to creation of precipitations);
- Item for important mountain forests (protection of cultural landscape against water);

- Expenses on covering of the forest functions mentioned in forests important from the standpoint of water management of the country, it means a sufficient protection of water sources and adequate protection of cultural landscape in foothills against the erosion and floods.

Unfortunately, in the policy-economical thinking the forestry is considered already long time only as a production sector. The Forest Act No. 61/1977 Coll. did not include the torrent service tasks and thereby this service lost a legal rule. Since that time its gradual inhibition occurred in terms of lack of interest to cover activities of such services in forestry practice. Unfortunately the same happened also in forestry policy realised by responsible department of the Ministry of Agriculture. Lack of interest exists in this matter also in the environmental policy of the Ministry of Environment, which is in relation to forests oriented mostly on nature conservation for nature as such, not on the environment of cultural landscape as a living environment of mankind.

A real introduction of services (PES) indeed requires to solve also such issues as e. g. forest categories; character of work of respective state administration bodies, which deals with forests; public relations; improvement of awareness (particularly also with people responsible for macro-economy, policy-makers and NGOs). There are a lot of publications related to above-mentioned issues, however the practical forestry policy does not proceed in this direction.

Because the forestry sector was embraced as like productive branch of timber production, the appropriate amendment was not applied and its economic structure was not changed for activities having character of public useful services in the time of central planned economy. Relations of forest operations (timber production) with silvicultural service activities were not considered as an element of structural arrangement of forestry sector structure. After the changes in 1989 shifting to market economy system started and also changes of legislative system was necessary. But the conception of forestry as production sector goes on also in so called liberal democratic system.

Forest legislation of the Czech Republic is covering the services only marginally. Valid Forest Act No. 289/1995 Coll. knows "non-productive functions" (§ 2b), knows also forests of special categories, however in § 38 on purpose-made forests it considers a duty to "suffer limitation at management of such forest stands". It covers only title of financial burden rising to owners from "limitation of forests management". It means again, that "forest management" is considered only as a production of marketed goods or substances, not as a silvicultural service. Law is then far away from the conception of services like components of forest estates economic exploitation in public interest. Services are, in fact, considered according to the classical approach as a "limitation of management".

Forestry failed to care for run on services in the area of forest - water relation. There were not created appropriate political and legislative conditions of existence for such services. Unfortunately, nor tragic events - floods of 1997 and 2002 – were not utilised to improve this situation. On the contrary, forestry gets onto the pressure e.g. of militant conservationist, arguing by current forest management like causes of big waters. They usually are adversely obstruct against restoration of arrangements on torrent streams of mountain areas in spite of the fact that it is an inevitable component of cultural landscape protection in foothills.

Essential features, that would be helpful in establishing of silvicultural services in Czech forestry are known already long time – they in fact lead to the Torrent Control Service creation 122 years ago.

- Densely populated cultural landscape with very rich infrastructure under the border mountain range with torrent watercourses, currently highly sensitive to the water element;
- Big share of fresh, potable water, coming from surface waters (more than 50 %), from water basins) with extraordinary emphasis on protection of raw-water quality (washing in drainage area; price of potable water as a consequence of processing technologies); also dispensable water quantity plays a role (losses by evapotranspiration in watersheds).
- Relatively high forest coverage of watersheds important from the water management point of view, often in areas of lower mountains; and consequent responsibility of forestry in retention and retardation of precipitations runoff);
- Relatively high usage of techniques in managed forest, particularly in cutting and timber transport operations impending harmful influence over the soil, runoff mode of catchments and water quality (tractors in skidding, density and character of transport lines and forest roads of all types).

Purposeful silvicultural services in relation of forest and water have been examined, identified and quantified thoroughly in the Czech Republic: there are fixed positions and areas of different kind of forests important for water management long ago. Survey of all forests with important non-productive functions (and then with needs of concrete silvicultural services) is annually available in detailed table of the yearbook published under the auspices of Ministry of Environment.

Forest research investigated causal iterations between forests of different character and their qualitative and quantitative water effects. Forestry-hydrological research on comparative catchment areas is carried out almost 80 years already, detail research of hydric components of forest ecosystems with the sight to public useful silvicultural services run since 70tieth of 20th century. The attention was also paid to the economic parameters of silvicultural services in the frame of water management forest functions. E.g. there was fixed the extent of forests stands important from the standpoint of water management. It was only about 4 % of the area of respective stands, it is 1.1 % of total forested area of the country - thanks to this fact that there was worked out a system of the multipurpose management and maintenance of these forests. The economic effectiveness of silvicultural services in stands important for water management was investigated, too.

However, there is a lack of political will in the Czech Republic create conditions for implementation of research results into forestry practice. It would need a political transformation of forestry as a production sector of national economy to the sector, which integrates production of wood and in the same way is pointed on providing of silvicultural services (as real PES).

There is a need to have in mind the fact that more than elsewhere in the Central European region (strongly affected by century-long human activities) forest related activities should take into account the entire landscape system, which is facing multilateral demands of a highly industrialised and mobile society. Human beings represent a part of the system and thus principal point of focus in environmental policy is on preserving people's opportunities. Also it has to be considered that forest ecosystems help to maintain a flow of variety of ecological services, which are the precondition to all economic activity. And to repeat that sustainable forest management has three pillars: environmental (ecological), social and last but not the least, economic one.

Analytical fluxes especially also in economics of services have been oriented on all important, publicly beneficial non-productive forest services, it means on all kinds of silvicultural services in following fields: water management, soil protection, recreation, health and nature conservation functions. It is necessary pointed out, that the attention was paid to aimed functions. It means in such cases, where natural spontaneous effects of forests lacking public needs and

there is a need to put into forests necessary capital to obtain appropriate quality and quantity of their demanded effects in precinct and time, or to suppress undesirable effects, too.

Analyses of research projects and many year's experience however shown, that put up with an environmental services only by spontaneous effects of forest ecosystems form cannot be sufficient to the society real needs on many localities. It is the fundamental difference of forest functions in relation to waters and recreational and health area comparing to the functions in nature conservation (in this case the natural forest condition is ideal, but definitely not in other functions!). It seems that enthusiasm for ecology faces today to absolute overestimation of ecosystems spontaneous effects on environment from standpoints of human society relevant needs.

Regional Plans of Forest Development should catch up also necessary non-productive forest functions in public interest. In the case of political change dealing with the character of forestry, these plans would become the basis for work of state administration bodies responsible for forests. Their orientation on enlightenment, consultations and awareness improvement of forest owners and managers to activities in related to silvicultural services should be of importance. Respective bodies are devoted to such activities only minimally. The administrative, supervision and controlling activities absolutely predominate up to data: namely in state forest administration in Forestry Department of Ministry of Agriculture and also from the side of the Czech Environmental Inspection dealing with forest protection under the leadership of the Ministry of Environment.

National legislation generally comes from the consensus, it concerns also forestry policy. Laws do not create policy. That is why, that at current status of forestry policy in the Czech Republic it is impossible to expect that ecosystem services or publicly beneficial forest functions should be supported by forest legislation. Legislation related to nature conservation is starting to be aimed at this matter (compensation for Natura 2000 system costs); indeed this is a service to nature for the nature as such. There is no relation with the environment of cultural landscape as a living environment of people.

The second attempt to amend the Act 114/1992 Coll. on Nature and Landscape Protection has been accepted by the Parliament. The amendment 218/2004 Coll.; § 58 represents a break in philosophy of approach to landowners. This paragraph deals with a "Compensation for aggravating of agriculture or forestry management". Before the law said, "everybody is obligated" but did not offer anything for covering of possible losses of forest owner. Unfortunately, up to data, the ministerial notice for providing this part of the law is not available...

Support of activities related to services

In 1982, based on the long term research, there was proclaimed as generally binding rule in the law of respective ministry of that time (forest and water management) the procedure of multipurpose forest management in protective zones of potable fresh water sources (about 10 % of total forested area). However, financial mechanism could not be solved because of mismatch of political conception on forestry like production sector of national economy.

Forest owners (they in fact exist only after 1989) had possibilities to supplicate with plea for subsidies in support of activities related to non-productive forest functions (part of the state budget under repair of the Ministry of Agriculture). This item was indeed scratched as the first from the grant system at initiation economic procreation some time ago. And after the changes in Civil Service organisational system (2003) this money are in the hands of regional authorities,

however without concrete determination of titles, which should be supported. If the leadership of the region has another priority, there should be no money spent in forestry at all.

Total expenses from the state budget covered up to data hardly one fifth of annual calculated costs on functions of forests important from water management point of view, with all the time decreasing trend.

Hopefully, it will be possible to use the Regional Plans of Forest Development (RPF), which are declared by forest law as a tool for implementation of state policy, for extension services in work of other state agencies or other stakeholders with interest in silvicultural services. Since absolute majority of forests important from the water management standpoint is managed according the regular forest management plans, it means that all necessary functional measurements in them can have the rational background and should be inspected.

Integrated water management is exceedingly interesting idea. Both, in abroad and as well as in the Czech Republic there were already years ago published a scientific study on forest stands important from the water management standpoint as an integral component of water management systems. However, there is a lack of (permanent) political will to change those ideas and findings of research into operational reality. Services of forest ecosystems and above all silvicultural services in cultural landscapes represent the permanent challenge. And particularly in the Czech Republic representing Central European water sources area with forested upland and hilly landscape, with frequent occurrence high waters on torrent streams and important water basins with catchment areas differently endangered and problematic processing of raw water on potable one.

Environmental ecosystem services (PES) can bring the real satisfaction of human society concrete needs. Those must be satisfied by real, concrete goal-directed services in consequential issues of protection of fresh water sources and protection of cultural landscape from adverse water effects, erosion and floods. Currently we are living in cultural landscapes, quite different from those ones of early Middle Ages with relatively untouched nature and with streams of pellucid water, almost without any infrastructure and consequently relatively little sensitive to natural elements.

A new, modern forestry policy in connection with accordingly holds environmental policy should be a tool for implementation of silvicultural services. On this basis could be then created a new legislation, inclusive solution of services incorporation into the economic system of forestry. Also the position of services like equivalent components of forestry management in functionally integrated branch, it means forest production and silvicultural services, dealing with " forest ecosystem services" (non-productive functions).

Suitable providers of real services in forest-water relation matters are all forest owners and managers, indeed those whose forest stands come under the conception of "forests important from standpoint of water management" (around 28 % of total forested area in the Czech Republic). Spontaneous "forest ecosystems services", without any further financial inputs will be sufficient in other forests. They are covered in commercial forests by routine management in intention of forest legislation, according to authorised forest management plans and forest management guidelines.

Improvement of communication and awareness

Very important are communication, collaboration and co-operation between Ministry of Agriculture and Ministry of Environment. The serious, meanwhile not respected risks for cultural

landscape menace according to the present analyses and experience just at the area of forest and water relation.

It is necessary to approach to private forest owners with respect to proprietary laws, at least in conformity with the constitution. The state should initiate services, which they offer through their forests, by enlightenment, consultations and searching of social overhead capital sources particularly at the time of start and trial run of these services.

Big danger of for payment for services in forest-water relation is the ignorance of forests possibilities particularly on the side of hydrology experts preparing technical and model solving water management problems in particular catchments not taking into account their areas. It is partly also a consequence of lack of forestry presentation and its possibilities related to public services.

"Forest ecosystem services" has only character of ideas in the Czech Republic. To fulfil these ideas is facing to lack of the most important items - political, legal and economic basis.

In closing

Solutions of many forest-related problems in the Czech Republic lie outside the forestry sector. Consequently there is the need to stress the cross-sectoral responsibility for our forests and forestry issues.

There is a necessity of participating in international processes dealing with forests - declaration that our country is going to fulfil its commitments. However, such participation would have the desired effect only if there is a political will to solve related problems on a conceptual basis and if it is based on and respects all other related agreements it means *i. a.* if there are convenient conditions created for e. g.:

- overcoming of gaps in collaboration between and among those involved with forestry science, research and practice and insufficient communication at various levels;
- lack of general public involvement in forestry issues and awareness on forestry as such;
- improvement in overall education and public relations;
- institutional building and capacity strengthening in spite of existing budget cuts;
- and responsible and respectable behaviour of all stakeholders including policymakers.

A linkage between forests and water is clear and they belong to each other inseparably with no doubts. Forested areas, sometimes defined as vulnerable and endangered ecosystems, require an improved cooperation among citizens, users, scientists as well as politicians. A goal should be a fair distribution of benefits, respectively a reasonable regulation of use and efficient management of natural resources in favour of all people.

It is perhaps good to mention a necessary integrated approach to the issues related to forests and water. Particularly because of the care on forests and water and control of responsible management in respective areas cannot be only in hands of foresters but it must be an interest of many other parties involved, stakeholders, including local as well as state administration. Also, for forests and water there is in place a call for a shared responsibility that represents one of the main political topics of the Ministerial Conference on Protection of European Forests in Vienna 2003.

A sustainable management, and hopefully also development, of forests can be reached in spite of the unfavourable conditions. With regard to a broad spectrum of benefits expected, it can be averred without any doubts, that forests and water, which are considered as the most common commons, deserve social inputs into their support.

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