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ENVIRONMENTAL SERVICES - CZECH REPUBLIC NATIONAL REPORT

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Abstract

The paper presented tries to give a basic information on situation related to ecosystem services that are ensured by forests in the Czech Republic. Presented information is made from the forestry point of view and concerns, in the line with the main topic of the workshop mentioned above, particularly water as a general precondition of life. Except of general information there are added some notes to particular parts/items of the outline offered by organisers to facilitate preparation of national reports, supposing rightfully that not all countries (including the Czech Republic) have already a scheme of payments for ecosystem services in place.

Key words: forest services, non-productive functions, spontaneous effects of forest ecosystems, lack of political will.

Introduction

The outline or questionnaire offered to prepare the national report operates with the concept of "payments for ecosystem services (PES)" and is concerned clearly to the inter-linkage of forests and water. In this area of "non-productive forest functions" the concept mentioned is not known in our country in breadth that is perceptible from the whole text of the outline prepared for "country reports". 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.

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

General Information

A conception of "payments for ecosystem services" (here-in-after PES) is a crucial issue. This term is noted from latter American professional literature and it seems that by this term are mentioned spontaneous, for human society positively applied effects (positive externalities for economy in a broad sense, inclusive environmental and social effects, and also natural forest

infrastructure). 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" (also natural forest infrastructure). So called "ecologicistic thinking" - without any analyses - does not accept such services according to its ideology. The conception of these services are usually considered as "archaic", even "tour thinking" (*sensu* Vyskot).

Such notions suppose that forest (particularly natural or close-to-nature) will offer all environmental services without any silvicultural intervention. The existence of forest dysfunction is rejected without any real base. This opinion can be likeable to some economists - the forest arranges everything without any deposit of energy, material and capital... The often heard - proudly sounding but thoughtless - slogan, that we foresters afford to society "all functions", only supported this opinion.

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). As a public beneficial service of state administration to the protection of cultural landscape against the water crossed over up decennium environmentally meaningful activities into the forestry sector and as a care of torrent catchment areas it has since 1960 the exact, rationally formed tasks mentioned in legislation (Forest Act No. 166/1960 Coll.).

The policy-economical idea of forestry mentioned - forestry only as a production sector however led hereto, that 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.

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 (state research 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.

A real introduction of PES indeed requires to solve (with a new approach in the intention of new forestry) 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.

The generally binding legal rule (the "Instruction to the management of forested land in protective zones of water sources" No. 13/1982) was processed pursuant to results of the checking project in forestry practice (1979) and then published as a publication of the Ministry of Forest and Water Management in 1982.

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. It surely influenced the implementation of this standard in forestry practice.

After the changes in 1989, with shifting to market economy system and also with changes of legislative system the above mentioned instruction No. 13/1982 lost its liability as an assignment standard. The conception of forestry as production sector goes on also in so called liberal democratic system. 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.

Brief notes to particular items of offered questionnaire (outline of country report)

I.A - Determining factors for using payment for ecosystem services (PES)

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 proprietors from "limitation of forests management".

It means, 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". Similarly, the paragraph § 35 can be mentioned ("soil improvement, amelioration and torrent control in forests"), where to question-mark of forest policy character comes up also an uneasy in-expertness in conception of torrents control (they can be carried out exclusively "in forests").

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 got onto the pressure of militant conservationist, arguing by current forest management like causes of big waters and being 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.

I.B - Characteristics of river basins or ecosystems favourable to establishing PES

Essential features, that would make easier position of the PES in Czech forestry are known already long time – they in fact lead to the Torrent Control Service creation already 120 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).

I.C - Measuring ecosystems services

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. There was found a lot of many further parameters of objects and phenomena, decisive for relation of forest ecosystems (particularly in relation to their antropogenic components in cultural forest stands) to water regimen, e.g. density of forest roads net as one of the most crucial factors for retardation and retention of precipitations runoff, problems of environmentally friendly technologies especially in skidding on steep slopes.

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).

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, where's possible rise detriment on performance market houses and lands owing to functional measurement (however it was only about 4 % of the area of respective stands, it is 1.1 % of total forested area of the country) thanks to the fact that there was worked out a system of their multipurpose management and maintenance.

The economic effectiveness of silvicultural services in stands important for water management was investigated, too. E.g. near the water basins there was found quite high economic effectiveness in protection of raw water quality.

Care on forest functionality of big water basin catchment area, endangered by soil erosion, was roughly eleven times economically more effective, beyond otherwise necessary use of effective technologies as late as in converter plant of raw waters, taking into account only the less weighty basin pollution by the soil washing off.

In the case of another civilising pollution (agricultural fertilisers) of other big basin there was the functional forest more effective till more than twentyfold.

Influencing of stream flows of mountain forests with their detention capacity there was founded till 2 times multiple effectiveness of silvicultural cares on forest functionality, namely in decrease of economic claims of big waters (catchment area of the Ohre River).

Such studies were completed and published already before quarter-century.

I.D - Social and economic aspects

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.

I.E - Cost-benefits analysis of land use alternative and their impact on ecosystem services

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.

Since forest research determined areas of diverse forests important for water management, worked out and made a pilot projects dedicated to corresponding functional silvicultural measurements, it could come up also to calculation of needed costs connected with rising number of new working places after the introduction of services. Annual direct cost of forest water management function was counted at amount of 533 mill. Czech crowns (CZK) in 1992/93. In the catchment of newly projected water basin in mountain forest area there were calculated costs at the level of 16.4 thousands CZK (ca 547 EUR) per 1 ha of forests. It concerned particularly the forming of existing admittance to forests.

Scientific projects analysed advantages and drawbacks of the forest functions compared to the technical options by the cost comparison, as stated in the part I. D. 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.

The introduction of Regional Plans of Forest Development (OPRL/RPFD) into the forestry legislation in 1996 represents a great promise for silvicultural services realisation in the Czech Republic.

With the change of forest legislation in 1990s a new term entered to forest practice - **Regional Plans of Forest Development (RPFD)**. Therefore it is useful to present, not only to forest public, a basic information on purposes, goals, charge, methodology and technology of their processing. In 2001, the first phase of the RPFD elaboration ended. With new possibilities of computer technology usage with the numeric and graphic data processing, the evaluation of the data from forest regions gained higher level of quality. The RPFD work makes it more correct the information collected and evaluated by hand between 1953 and 1990. Analytic processing of complex numeric data from forest management plans (LHP) and forest management syllabi (LHO) enables, for the first time in history, to evaluate exactly and to compare mutually the growth conditions in these forest regions. The Geographic Information System (GIS) - TopoL SW and its superstructures enables to process even graphical data. Complex maps in a continuous display covering the whole area of the Czech Republic have been developed. Extraordinary and maybe unique in the world is the data processing from the whole country under united methodology, by united technology and in united database structure. The GIS database structure enables to connect the graphic and text data with any other information (text, graphic, photo or video-sequence). Forest regions were evaluated in better quality and it is possible to edit and update them quickly and effectively.

RPFD are legislatively established in the Forest Act No. 289/1995 Coll., in the Notice of the Ministry of Agriculture No. 83/96 on RPFD processing. Also the Definition of Management Complexes of Forest Site Types (MSS) as a methodical tool for the state forest policy (Ministry of Agriculture of the Czech Republic - MZe, 1994) concerns this issue. They recommend principles of forest management. The target of RPFD is to create conditions for elimination conflicts between public and owners' interests on forestland, to find appropriate proportion of support of particular forest functions and to recommend differentiated principles of management oriented to achieve the targets. Requirements put on in the RPFD resulted from the sustainable forest management principle. It means that it is necessary to understand a forest as an ecosystem and that it can fulfil required functions only when ecological rightfulness is optimally implemented. The real charge of RPFD comes out from:

- Analyses of forest state in forest natural areas (LO) (Notice of the MZe No.: 83/1996 Col.), which draw from data research and analyses (forest typology, forest protection, forest function survey, and global transport accessibility);
- Syntheses of analytic data projected into a draft of framework management guidelines as a base and recommendations for forest management plans (LHP) and forest management syllabi (LHO) proceeding including strategic long-term arrangements following the requirements of sustainable forest management.

RPFD contain global information on forest state and on the role of the forest as a public interest subject including strategic recommended management guidelines following the ecosystem conception. They become an important background in decision process within the regionally differentiated state forest policy and in promotion of the public interests.

RPFD methodology is drew up as open, it is capable to respond coming new knowledge and information needs.

For individual forest regions, RPFDF are processed for the period of 20 years - I. Period - general (1997 - 2001), II. Period - data updating, data administration, monitoring of trends will be processed continuously in accordance with the LHP updating timetable.

There are several thematic groups of RPFDF expert problems, which base of united digital processing in graphic program (SW TopoL). Following data are processed in this program:

- Analyses of natural conditions in accordance with forest site typology
- Forest functions
- Forest protection
- Forest accessibility

Regional plans should catch up also necessary non-productive forest functions in public interest. In the case of political change dealing with the character of forestry, OPRL/RPFDF 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.

Consumer's willingness to pay in relation of forests and water is mostly economic and social-political issue. There are effects of forest functions, which do not find the concrete customer - those are so called *public goods genuine*. Sometimes it is a question also in the case of some marketed effects, what's real - to look for the consumer or for the reimbursement from sources of social overhead capital (public goods non-genuine)? They are well known social-political problems e.g. in the field of protection of potable, drinking water sources.

II.A - Legal and regulatory frameworks that can help establish payments for ecosystem services

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...

Several national seminars on forestry legislation improvement confirmed a need to change current legislation related to forests. 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.

State administration considered that the worst problems in current Forest Act are as follows:

- the act is too complicated and in some parts it does not content quite explicit provisions;
- there was possible to penalise only forest owners or entrepreneurs according this law – not other persons violating it;
- the part related to protection of forest land is not easily understandable;
- there are failures in the part dealing with prohibited activities and also with forest management.

There were created 5 working groups (together 19 people from both ministries - Ministry of Agriculture, Ministry of Environment), which have to cover following items:

1. Categorisation of forests, forest management, forest protection, fellings, forest production record keeping;
2. Protection of forest land (forest stands with its environment and land designated for the *fulfilment of forest functions*);
3. Forest manager;
4. *Subsidies in forestry*, offences and fines;
5. Common usage of forests, licences, supervision in forestry activities.

Under this item analyses and evaluation of forest acts for all countries adjacent to our country should be mentioned. It was worked out in connection with discussion on the strictness of the Czech forest law. Countries like Poland, Slovakia, Austria, Bavaria, Saxony and Federal Republic of Germany were included, which mostly have the same historical and civilising development of forests. For purposes of this work it was stated, that sound forest management is such one, whose principles lead for implementation of all indicators adopted by MCPFE. It has been found how the legal rules tackle criteria of forest sustainable management. European legal rules access to particular criteria very differently.

It is interesting that as the most important and weighty criteria are presented:

- Legislative solving of non-productive functions,
- Solving of state supervision on forests,
- Support of various types of ownership, protection of forestland (deprivation).

II.B - Contractual arrangements

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 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 Ministry of Agriculture). This item was indeed scratched as the first from the grant system at initiation economic procreation some time ago. After the changes in Civil Service organisational system this money are in the hands of regional authorities, however without concrete determination of titles, which should be supported. If the leadership 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 (OPRL/RPFD) *in extenso*, which are declared by forest as a tool for implementation of state policy (see above), 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.

II.C - Socio-economic and environmental impacts of PES

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 represents the permanent challenge: 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.

From standpoints of social-economic and environmental aspects there is a need to repeat: If environmental ecosystems services (PES) are understand in spirit of ecological moralities only as forest ecosystems natural effects itself without aimed directed interventions of man, it will satisfy only notions of theoretical environmentalist. It cannot bring the real satisfaction of human society concrete needs, which 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. 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.

III.A - Challenges for the establishment of PES

Trigger mechanism would be the elaboration of new, modern forestry policy in connection with accordingly hold environmental policy. On this basis could be then created a new legislation, inclusive solution of services incorporation into the economic system of forestry as well as 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. Economic assessment of these spontaneous environmental and social effects (associated effects of forest production in commercial forests, effects of simple existence of non-managed forests) is still a topic of scientific studies at present. These studies have very different views particularly because of endeavours to value nature economically for nature itself (*l'art pour l'art*) and usage these studies in economy or even in legal sphere and juridical practice.

Identification of customers requires above all economical-political analysis of needed effect character (character public goods genuine, goods vicariously marketed, effects of real market character).

Very important are communication, collaboration and co-operation between Ministry of Agriculture and Ministry of Environment. Meanwhile it appears as uneasy, possibly formidable problem, because ideas of "deep ecology", having sympathy on one side, do not render human society needs. 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. There is an example of protected outbreak of bark beetles in cultural forest ecosystem of national park with dieback and extinction of thousands hectares of mountain forest stands: such a destruction in commercial forests is considered by respective department of Ministry of Environment as

ecological drawback reaching the value of billions of Czech crowns. On the contrary, in the national park thereby any ecological detriment does not come...(!/).

Private forest owners are already long time frightened by ecological activists, that it will be their civilising duty to do or do nothing with their forest estate - according to what the nature itself requests (and body of state protection of nature prescribes). Analysis of needed costs and detriment is meanwhile not a component of nature conservation plans and projects. 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. Problem is partly on the side of bodies responsible for state and public funds and social overhead capital. It is a consequence of lack of forestry presentation and its possibilities related to public services. The question of insufficient public relations and forestry image is from time to time officially discussed but usually again fall asleep; it is persevered in the state, which should be considered as unsustainable.

III.B - Challenges for the dissemination of best practices

Responses on points in this part result from the previous facts. There is a need to confess that question of "forest ecosystem services (PES)" 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.

III.C - Challenges for the private sector

Over the last decade, 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.

Furthermore, 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.

III.D - Challenges for research and capacity building initiatives

New challenges are confronting the managers of the world's forests, with stakeholders demanding a broader range of goods and services, as well as a voice in setting priorities on the use of forests. Management is becoming more sophisticated and adaptive, seeking to achieve balance among multiple products and services. Good science has a vital role in generating new information that can *inter alia* provide input to the international dialogue on forests.

Previous to the transition, forestry research institutions were an integral part of the central planning regimen and were almost exclusively funded by state resources. Consequently, research efforts were focused largely on attaining central political and economic objectives. In the wake of political and economic reforms, state funding for forestry has steadily declined, and has not been supplemented with any substantial resource inputs from other sources. Personnel in forestry institutions have diminished due to decreased funding and inadequate salaries, and many of those remaining have supplemental occupations and so are not fully focused on forestry research. Consequently, forest research has suffered. Under-funded and under-staffed institutions have been unable to maintain ongoing medium- and long-term projects initiated before funding cutbacks. Also, in times of hardship, institutions and people tend to fall back on what they know and do best. Thus, ongoing research tends to be largely entrenched in classical scientific and technical topics that were the focus of attention and expertise during the previous era. As a result, research is not evolving to meet new social and economic needs emerging from ongoing industry privatization. The problems are compounded by the fact that management of institutions has adapted slowly to the new economic environment, and the functioning of these institutions is problematic. Research now needs to be marketed and sold, and short-term economic impacts must be considered, in spite of the fact that forest management goals are generally long term. Furthermore, considerable effort must be made to solicit resources from the consumers of research. However, not very high interest of private entrepreneurs in funding of research was already mentioned above.

Changes in CINT have necessitated revision of policy and legal frameworks in all sectors. In particular, UNCED and subsequent follow-up activities have led to a new awareness and activism in environmental protection, which has had a direct impact on forestry. Thus, environmental protection is receiving more attention and the forest management 'pendulum' is swinging slowly away from a solely fiber-focused strategy to that which is more holistic and incorporates ecological, social and economic values. This globally accepted strategy and new evolving forest management paradigm presents many challenges and opportunities for forest science.

Unfortunately, there is a lack of young people in forestry research. The skill requirements in the next century are expected to be drastically different from what they are today; unfortunately insufficient efforts are being made also in our country to identify these and to develop the necessary capability. Research institutions will have to develop mechanisms to widen their scientific capabilities and develop arrangements to include disciplines and peculiarities are traditionally not included under the purview of forestry research. There is a need to learn to work effectively as a team - scientists' productivity is likely to increase together with the quality and relevance of their work. As this happens, the scientists and their institutions may gain more recognition and influence in their country and beyond. This could lead to increased core funding by the government or by international agencies or donors and a more influential voice in developing options and alternatives for policy development. Collaborative arrangements within and between particular institutions and countries are still generally weak and there is inadequate interest and commitment to regional initiatives that could cost-effectively supplement and complement national and international efforts.

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.

Main problems (based on questionnaire distributed to 80 representatives of various stakeholders)

- Bad medial presentation of forestry.
- Never ending friction among environmental and forestry department lead to mutual competition what consequently represents the reason of the weakening of forestry sector position.
- Solving of some spats by bilateral compromises does not make a good service to forestry as such sometimes.
- New laws are prepared in hurry: new laws are worse those old ones.
- Two ministries responsible for forests.
- Chaos in the whole woodworking complex.

The overall situation of the Czech forestry in the last year does not support the concentrated efforts to solve necessary issues including urgent improvement of various laws related to forests and forestry, which could and should concern also such issues like payments for ecosystems services.

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Annex

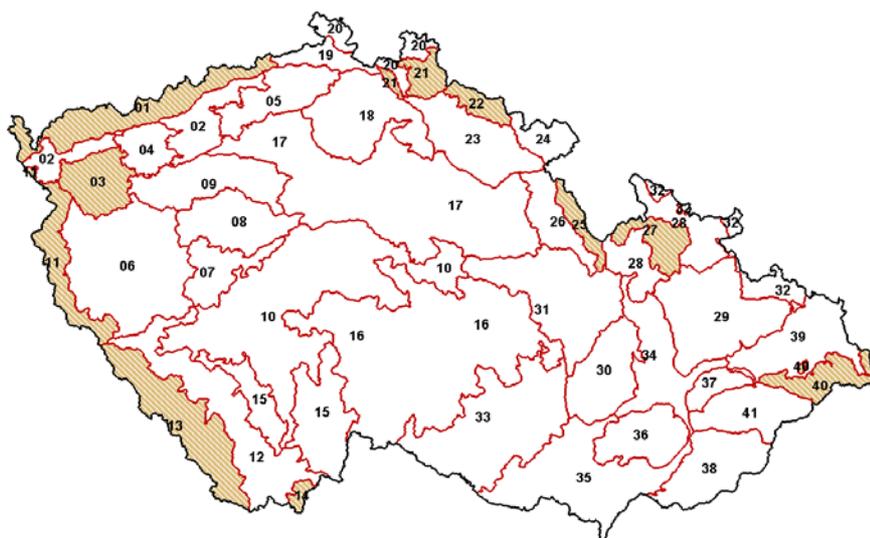


Fig. 1: Natural Forest Areas of the Czech Republic (areas with a significant proportion of mountain forests - having mostly also importance for water resources management - are hatched).

NFAs in the Czech Republic are as follows (areas with significant proportion of mountain forests are in bold):

1 – **Krušné hory Mts.**, 2a – Cheb and Sokolov Basins, 2b – Most and Žatec Basins, **3** – **Karlovy Vary Hills**, 4 – Doupovské hory Mts., 5 – České středohoří Mts., 6 – West Bohemian Upland, 7 – Brdy Hills, 8a – Křivoklát, 8b – Bohemian Karst, 9 – Rakovník-Kladno Upland, 10 – Central Bohemian Upland, **11** – **Bohemian Forest**, 12 – Foothills of Šumava and Novohradské Mts., **13** – **Šumava Mts.**, **14** – **Novohradské hory Mts.**, 15 – South Bohemian Basins, 16 – Czech-Moravian Hills, 17 – Polabí, 18a – North Bohemian Sandstone Hills, 18b – Český ráj, 19 – Lužice Sandstone Hills, 20 – Lužice Upland, **21** – **Jizerské hory Mts. and Ještěd Mt.**, **22** – **Krkonoše Mts.**, 23 – Podkrkonoší, 24 – Sudetské mezihoří Mts., **25** – **Orlické hory Mts.**, 26 – Foothills of Orlické hory Mts., **27** – **Hrubý Jeseník Mts.**, 28 – Foothills of Hrubý Jeseník Mts., 29 – Nízký Jeseník Mts., 30 – Dražanská Hills, 31 – Českomoravské mezihoří Mts., 32 – Slezská Lowland, 33 – Foothills of the Czech-Moravian Hills, 34 – Upper Moravian Vale, 35 – South Moravian Vales, 36 – Central Moravian Carpathian Mts., 37 – Keleč Upland, 38 – White Carpathian Mts. and Vizovice Hills, 39 – Podbeskydská Upland, **40** – **Moravian Silesian Beskids**, 41 – Hostýn-Vsetín Hills and Javorníky Mts.

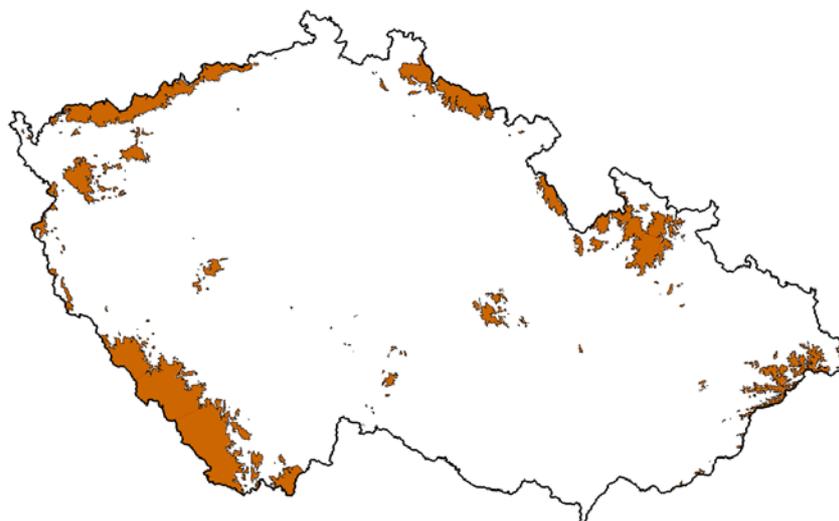


Fig. 2: Localization of mountain regions of the Czech Republic from the 6th forest vegetation zone (from 700 m above sea level) to higher altitudes.