NUMBER 1 | VOLUME 17 | APRIL 2009

EFI news

Editorial

As new Regional Offices (RO) are emerging in Freiburg/Nancy/Zurich, Bordeaux, Varaždin and Vienna, EFI is not only facing organisational changes but more importantly new possibilities and potentials. EFI ties the network of forest research related institutions across Europe tighter with Regional Offices and Project Centres as nodal points. EFI's possibilities to better mobilize research capacities increase significantly because of two main factors.

Firstly, EFI improves and intensifies its contact with its Members, countries that have signed the EFI Convention. ROs have easier access to government institutions in their regional context and can thus better and more regularly find out about policy relevant research questions. The direct contact between EFI and its Member States can significantly improve the relevance of EFI research also for the MCPFE or other European-wide issues.

Moreover, the network of Regional Offices allows EFI to initialize research topics at various places in Europe simultaneously and with the same or a similar methodological approach. This will allow EFI not only additional capacities but also the comparability of research results in a bigger geographical European-scale context. Also responding to EU funded research calls as well as other sources is likely to become easier with the new organisational structure.

At the same time these improved possibilities allow for even closer cooperation between EFI and its Associate and Affiliate Members with benefits for everybody active in this context. Let us utilize these opportunities together for the wealth and prosperity of all our forests in Europe.

Konstantin von Teuffel
Chairman of EFI Board

Network Speaks

Good communication – a strong weapon

Communication is the only way we can give a face to our industry and disseminate the forest based sector's messages. It gives us the opportunity to talk with authority and become trusted and valued.

We all have a responsibility to explain and educate about the role of our industry as forests are very close to people's hearts and carry very emotional connotations. "Working" on forests, is currently perceived as destroying them, or at least damaging them. We must convey the message that it is by working in the forest that they are better preserved and that forest based products, such as wood and paper, are essential in our everyday life.

We must also recognise that the people we need to influence and inform are not sitting next to us in our offices or plants but may be quite divorced from our daily operations and activities and as such unaware of our working language. We must always keep communications simple and short.

Our opponents excel in targeting the right audiences with the right messages and we need to learn from this. But we have a great story to tell and many misconceptions to correct. Our raw material for example is a living material, constantly regenerated and in constant growth but this natural and renewable element is ignored while competing materials that are using non-renewable resources are accepted without question.

We must recognise that most people are ignorant to the real situation regarding our industry and our products and we are the only ones who can act to change perceptions.

We must also look to the future and the next generations and understand how they communicate and learn. We underestimate, at our peril, the power they have in influencing decision making and in changing behaviour.

Good communication is the strongest weapon we have in our armoury. Let's use it well.

Teresa Presas
Managing Director, Confederation of European Paper Industries (CEPI)

Guest editor Marcus Lindner | EFI

While many studies have investigated potential impacts of climate change, much less attention has been given to the adaptive capacity in the forest sector and few studies have assessed vulnerability of forestry to climate change. The regional context is important, as impacts can be both positive and negative and the ability and strategies to cope with climate change impacts may differ.

Focus on Climate Change

Human influence on earth's climate is becoming more and more obvious. For several years now, climate observations have proven the existence of a global warming trend, with the 15 hottest years observed globally since 1880 all occurring after 1990. The European heat wave of 2003 was a drastic demonstration of the extent of impacts we need to expect more often in the future. The Intergovernmental Panel on Climate Change has made several projections of emission pathways under different assumptions of economic development and policy regarding climate protection. It is very worrying that the development of observed increases in greenhouse gas emissions exceeded even pessimistic earlier projections. Latest climate change scenario projections for Europe suggest that by 2100 temperatures will increase between about

Darko Novakovic / www.creative-stock-photo.com / www.fotolia.com
Saku Ruusila

2°C in Ireland and the UK, up to about 3° in central Europe and 4°C – 5°C in the northern Boreal and parts of the Mediterranean regions.

Trees cannot adapt rapidly

Forests are particularly sensitive to climate change, because the long life-span of trees does not allow for rapid adaptation to environmental changes. Associated with climate change there are several factors affecting forest ecosystems, which can act independently or in combination. Two decades of research have significantly improved our understanding of these basic impact factors. Rising atmospheric CO_2 concentration, higher temperatures, changes in precipitation, flooding, drought duration and frequency will have significant effects on trees growth. Along with the direct changes in climatic factors there will also be associated consequences for biotic (frequency and consequences of pests and diseases outbreaks) and abiotic disturbances (changes in fire occurrence, changes in wind storm frequency and intensity) with strong implications for forests ecosystems.

These different impact factors will affect European forests, however severity of impacts on forest goods and services will depend on the regional situation and the specific changes in climate. Vulnerability to climate change also depends on the ability of natural ecosystems and society to cope with the impacts.

In a study for the European Commission (DG AGRI), EFI, together with partners from BOKU, INRA, and the Italian Academy of Forest Sciences, have recently reviewed the existing knowledge about potential climate change impacts in different European forest regions. The report analysed also adaptive capacity and the current understanding of regional differences in vulnerability to climate change. Moreover, options for adaptation to respond to the expected climate change impacts were reviewed from the scientific perspective as well as by surveying ongoing and planned measures in EU 27 member states. Several articles in this issue of EFI news highlight aspects from this report – providing insights into one of the most burning issues affecting European forests in the 21st century.

The full report "Impacts of Climate Change on European Forests and Options for Adaptation" is available at http://ec.europa.eu/agriculture/analysis/external/euro_forests/index_en.htm

The severity of impacts on forest goods and services will depend on the regional situation and the specific changes in climate.

Saku Ruusila

DI Dr Sigrid Netherer | Institute of Forest Entomology, Forest Pathology and Forest Protection, University of Natural Resources and Applied Life Sciences (BOKU), Austria

Cold-Blooded Species Likely to Benefit

Climate change already does and will continue to impact insect herbivores and plant pathogen species directly and indirectly via alterations in plant nutritional quality and plant resistance as well as through changing community interactions. Temperature increase, changes in the amount and pattern of precipitation, the frequency and intensity of abiotic disturbances, and the increase of atmospheric CO_2 will have a major influence on biotic disturbance agents and their host plants, and consequently on future forest health. It is essential to understand interactions between the various factors and their effects on forest ecosystems in order to evaluate and potentially anticipate future pest and pathogen problems.

Many exothermic – more commonly referred to as cold-blooded – organisms, such as insects, are likely to benefit from rising temperature conditions during the growing season and exhibit faster development and thus shortened life-cycle duration, changes in voltinism and reduced mortality. Increased density and size as well as changes in the genetic composition of insect populations are possible consequences. Yet, in case temperatures will rise above species optima, e.g. during heat waves, mainly negative effects on insect populations are to be expected, such as decreased growth rates, reduced fecundity and survival. Increased winter temperature may promote increased growth rates and lead to reduced winter mortality, but might also negatively influence the initiation and onset of periods of dormancy for certain species.

The changes in environmental parameters will and have especially become apparent in the altered frequency, intensity, size and geographical range of pest outbreaks. As an example, epidemics of bark beetles have recently been triggered by the higher frequency of storm events and periods of mild winters and particularly warm summers. Global change will further on influence the occurrence of species, as the size and location of distributional ranges depends on the interaction of available habitats with suitable climate.

As the geographic distribution of many forest insects is more limited than their host distribution, improved climatic conditions may result in range extensions. Species may expand into higher latitudes and altitudes, establishing stable populations in geographic regions where climatic conditions formerly restricted occurrence. Areas of potential pest outbreaks will probably shift or enlarge. Southern boundaries of present distributional ranges on the other hand are likely to become too warm, which will result in a northward move or even range contraction for certain species. Another threat could come with the arrival of exotic organisms not previously present in Europe, which has bee already observed.

In western Canada, mountain pine beetles ravaged 130,000 square kilometres of forest by the end of 2006. Is this where we are heading in Europe, too? So far, most impacts here have been more on the positive side. But we do see, for example, that bark beetle damages occur in higher elevations than before and more drastic adverse impacts are likely to occur in the future also in Europe.

Martina Berg / www.fotolia.com

Antoine Kremer and Sylvain Delzon | INRA, University of Bordeaux, France

Adaptive Responses of Trees

Recently documented sources on quaternary evolutionary history, observations from population and species transfers and provenance experiments shows that trees may have resources and mechanisms to respond to climate change. Trees have specific mechanisms at different levels – from single trees to populations and on to communities – that contribute to evolutionary changes tracking environmental change. These mechanisms, including plasticity, adaptation, dispersion and facilitation, depend on the amount of diversity (either genetic or epigenetic) residing at these different levels and the extent of gene flow among populations.

Greg Pickens / www.fotolia.com

Individual adaptation by plasticity can be seen in the temporal variation of fitness related traits observed during the lifetime of trees. Examples of population adaptation are supported by results of provenance tests showing large population differentiation for adaptive traits. On the other hand, past seed dispersion data obtained by fossil pollen records suggest that the speed of future natural dispersion may not be able to match with climate shifts in the future.

Learning from these records, we can study how these mechanisms may be acting during the ongoing and future climatic changes and propose options to enhance forest adaptation to climate change. We are anticipating strong differences between species having continuous distribution and species with scattered distribution, the former benefiting more from positive interactions between natural selection and gene flow. The rate of adaptive change may also be quite different between the leading edge and the rear end of distribution. Populations at the northern and eastern limits will be at the leading front of range shifts and may benefit from immigrating genes via pollen flow from southern latitudes; whereas adaptation may be more constrained at the rear edge, where populations are deprived of gene flow from "preadapted" populations.

Trials needed on enrichment planting

Hence, we suggest that adaptation to climate change should be enhanced by silvicultural practices during the regeneration phase (either natural or artificial) aiming at increasing reproductive potential, fecundity, population size and genetic diversity. In order to maintain high levels of genetic diversity, seedlings coming from different seed stands can be mixed. Introducing new reproductive material should be seen as complementing local seed sources and never as replacing local material. Enrichment planting in naturally regenerated stands can introduce plants with different genetic characteristics and will be important sources of adaptive capacities, not only at the rear edge of the species but also throughout a species' range. Mixing would increase the opportunities for new genetic associations to increase the fitness of the planted or seeded population. Assisted migration via enrichment sowing or planting should be based on results of provenance tests.

Michael Maroschek, Rupert Seidl and Manfred J. Lexer | Institute of Silviculture, University of Natural Resources and Applied Life Sciences (BOKU), Austria

European Mountain Forests Sensitive

Forest ecosystems are key elements in the land use matrix of European mountain regions, providing a variety of goods and services to society. These ecosystem services may be at risk due to the exceptional exposure of European mountain forest ecosystems to climate change, currently experiencing a temperature increase twice as high as the global trend.

Mountain forests are highly sensitive to climatic change. Biomass productivity is expected to decrease in water-limited low elevation areas while increase can be expected for currently temperature-limited sites at higher elevations. Besides increased water stress disturbances are expected to gain importance, with large areas of coniferous mountain forests becoming a suitable habitat for biotic disturbance agents. Moreover, changes in plant species competitivity and their subsequent distribution will affect structure and composition of mountain forests and in particular the tree line ecotone.

As a consequence of large ecosystem sensitivities considerable impacts on forest goods and services are to be expected. Timber production will be significantly affected by changes in productivity and intensified abiotic and biotic disturbance regimes which may hamper controlled management. However, climate change will also significantly broaden the silvicultural portfolio in mountain forests due to an increasing number of suitable broadleaved species.

An important ecosystem service of mountain forests is the provision of drinking water. Large scale disturbances may lead to changes in run-off as well as percolation patterns and negatively impact water quality through leaching of nitrate.

Protective functions are vital

Likewise vital for densely populated mountain areas is the protective function of forests against natural hazardous processes such as flooding, debris flow, landslide, rock fall and avalanches. While climate change might alter frequency and magnitude of these processes, the protective effect of forests will suffer strongly from intensified disturbance regimes. Conversely, a rising tree line will improve the protection against natural hazards by stabilizing erodible masses, reducing avalanche starting zones, dampening runoff peaks, and stabilizing soils.

An upward shift of the tree line ecotone, however, poses a threat to alpine and nival plant communities. In managed forests, where biodiversity is strongly influenced by forest management, the increasing competitiveness of species rich broadleaved forest communities may even promote overall biodiversity of the currently conifer-dominated ecosystems.

As a result of the high heterogeneity in European mountain forests climate change impacts will be diverse and vary locally. For a substantial share of these ecosystems adaptation measures will be required to maintain their goods and services. Scientists, policy makers and practitioners are called to join forces to tackle the challenge of a "climate-smart" sustainable forest management in European mountain regions.

luSh / www.fotolia.com

Marja Kolström and Marcus Lindner | EFI

From Adaptation Strategies to Implementation in EU 27

Successful adaptation strategies reduce the vulnerability of forest against the impacts of climate change. Reducing vulnerability involves both a reduction to the exposure to climate stress and an increase in adaptive capacity. In the EU 27 Member States, the main motives for adaptation are minimizing the impacts of disturbances, ensuring wood production and ensuring ecosystem services.

Currently, in the EU 27, most of the adaptation measures aimed to minimize the impacts of disturbances. Fire danger is expected to increase throughout Europe. Various measures are recognized to reduce fuel accumulation with suitable thinning methods and prescribed burning. The selection of drought tolerant tree species is an important adaptation measure because of the increasing risk of drought in Southern and Central parts of Europe. Decreasing the risk of wind damages includes measures to modify stand structure to be more resistant in Northern parts of Europe. Risk of outbreaks of pests and pathogens is reduced with measures ranging from monitoring to the control of biotic disturbances.

The second motive for adaptation measures is to ensure wood production. In the regeneration phase, tree species which perform well across sites are selected and can develop into stable diversified forests. Natural regeneration is preferred, because it allows natural selection. This will promote populations which fit well into the local environmental conditions. Tending and thinning of stands support reducing the risks of disturbances and the development of diverse forests. Harvesting, i.e. taking mature trees out of the forest, is changing too. Harvesting procedures are modified and especially in wet soils equipments and tools are improved.

Ensuring ecosystem services is the third motive for adaptation measures. In sensitive areas, like slopes with erosion problems, suitable tree species are planted and tending and thinning measures are limited or forbidden. Biodiversity of forests is necessary in the adaptation to the impacts of climate change, so biodiversity conservation is supported with ecological corridors, preventing fragmentation and maintaining old and dead trees. Carbon storage is an important ecosystem service in relation to climate change. Tree species, which increase carbon sequestration and produce biomass for energy, are utilized.

Uncertainty about the full extent of climate change impacts and the suitability of adaptation measures creates a need for more monitoring and further research. It is utmost importance to disseminate the knowledge on suitable adaptation measures to all policy makers at different levels, affected stakeholder groups, particularly to forest owners, forest workers, who need to implement the measures on the field.

One of the motives for adaptation measures is ensuring wood production.

Lena Ason / www.fotolia.com

Gert-Jan Nabuurs – New Assistant Director of EFI

Dr. Ir. *Gert-Jan Nabuurs* has been appointed Assistant Director of the European Forest Institute (EFI). Dr. Nabuurs will start his three-year term, with a possibility of extension, on 1 June 2009. The Assistant Director's post is a new one in the organisation and contributes particularly to the increased coordination role of the Headquarters.

Dr. Nabuurs (41) has a PhD in forest planning and economics and a MSc. in Forestry and Soil Sciences. He has previously worked as Teamleader of Forest Ecosystems Team and as a Senior researcher on European Forest Scenario Studies at the Wageningen University and Research Centre in the Netherlands. He also holds the positions of Associate Researcher at the European Forest Institute, and of Adjunct Professor at the University of Joensuu, Finland.

Dr. Nabuurs' main field of interest is in forest resource modelling of European forests for sustainable management in combination with climate change, carbon sequestration and biodiversity issues. Results of his work have been published in over 140 publications. He has also led several chapters in diverse reports of the Intergovernmental Panel on Climate Change (IPCC). He has extensive experience of project coordination and leadership. Among his many affiliations, are a membership of the expert group for the UNECE's 'European Forest Sector Outlook Studies' and deputy chairmanship of the IUFRO group 4.02.07: 'large scale inventories and scenario studies'.

Niina Verkerk

"My main task as the Assistant Director will be to broaden the scope of EFI, from forest sector aspects of wood supply, to climate change, carbon sequestration and biodiversity issues at the European scale. I see my role especially important in strengthening the research and outreach at the head office, and develop the coordination with regional offices and project centers. In addition, I will steer the acquisition of new projects, as well as strategic partnerships.", says Gert-Jan Nabuurs, the new EFI Assistant Director.

New Staff at EFI

Over the past few months, EFI has been welcoming new staff to the Headquarters as well as to home offices around Europe.

Hanna-Kaisa Jussila
Administrative Assistant
(EU FLEGT Facility)

Paula Ratinen
Accounting Assistant

Varpu Heiskanen

Mikko Savolainen
Programming Assistant

Niina Verkerk

Felix Seidel
Wood Tracking Expert
(EU FLEGT Facility)

Riitta Sorri
Office Assistant

Diana Vötter
Senior Researcher

Wendelin Werhahn-Mees
Researcher

Varpu Heiskanen

Ulla Vänttinen
Event and Project Officer

Legal Wood Supports Tackling Climate Change

Jade Saunders | EFI

As the current estimates show, deforestation accounts for around 20% of global emissions of greenhouse gases. Reducing rates globally would potentially be a useful step towards tackling climate change. The 2007 Bali Roadmap included a commitment of developing a system to compensate for avoiding green house gas emissions – know as REDD (Reduced Emissions from avoided Deforestation and forest Degradation). Developing countries in particular need help with governance to make the commitment and one of the practical ways to assist them is the FLEGT Action Plan, and the activities of the EFI FLEGT Facility.

The Bali Roadmap resulting from the UNFCCC conference of the parties in December 2007 included a commitment to developing a payment mechanism to compensate countries for avoiding green house gas (GHG) emissions by reducing their rates of deforestation. Broadly speaking the aim of the payment mechanism was to reverse the overwhelming current incentives for deforestation – establishing payments for standing trees rather than income being derived from only timber extraction or conversion to agricultural production. Beyond this aim there was little agreement on the practical scope of any proposed structure in Bali, but the concept was christened REDD (Reduced Emissions from avoided Deforestation and forest Degradation).

Deforestation accounts for a surprisingly high percentage of global emissions of GHG – rough estimates are around 20% – so reducing rates globally would potentially be a useful step towards tackling climate change. In addition, reducing deforestation has other potential positive environmental and social benefits such as habitat protections.

However, many of the world's remaining forests are in poor developing countries, meaning that their governments are not committed to reducing greenhouse emissions as UNFCCC Annex One countries are, and they often face significant challenges to reducing deforestation rate – often related to governance issues.

Forest governance: managing resources legitimately

Forest governance is a tricky concept with nearly as many definitions as there are

Niina Verkerk

The newly published portal at www.euflegt.efi.int offers further information on the FLEGT Action Plan, Voluntary Partnership Agreements and the EFI FLEGT Facility Activities.

people defining it, but in essence it can be broken down into ability to manage the resource and legitimacy around how the resource is managed. One element of effective governance is the enforcement of politically-accepted national laws relating to forests and timber production – ranging from environmental protection to timber extraction, processing and export requirements.

And this element – the enforcement of legitimate national forest law – is the focus of a set of initiatives under development by the European Commission, supported by a Facility team at EFI which is focusing on governance in tropical forestry.

The European Commission published the Forest Law Enforcement, Governance and Trade Action Plan in 2003, setting out a range of measures available to the European Union and its Member States to tackle illegal logging in the world's forests.

For the first time, the Plan explicitly recognised that the EU is a major consumer of wood products from regions where levels of illegality and poor governance in the forest sector are most serious, potentially providing valuable markets for illegal wood. European demand was seen as a significant driver of illegality, and as a result, the European Commission was encouraged to align its traditional forestry approach with a parallel focus on controlling markets for potentially illegal wood within the EU.

The aim was not simply to reduce illegal deforestation, but to attempt to tackle poverty by supporting good governance in countries selling wood to the EU. Ensuring that responsible companies in Europe prefer to buy wood from producers that comply with local law, pay for the timber they fell and act responsibly towards local poor people and the environment can start to help address these problems.

So the Plan aims to develop markets in Europe for legal products, encouraging businesses and consumers to pay the real cost of producing legal wood, rather than searching only for the cheapest price which risks sacrificing social and environmental concerns.

Role of the FLEGT Action Plan

The FLEGT Action Plan does this by focusing on trade policies that are under the control of the EU, and responsible purchasing by governments and timber importers in Member States:

EU trade policies:

- Developing partnerships with countries that want to tackle illegality in their forest sectors and demonstrate that the wood products they export to the EU are legal;
- Developing legislation to encourage importers to take responsibility for the provenance of the wood they buy; and,

Member State buyers:

- Encouraging European governments to purchase legal and sustainable paper, construction timber, office furniture and other forest products.
- Making companies in the EU aware of their responsibility to buy legal and sustainable wood, and helping them develop tools to do it easily.

Within these components the EFI Facility is focused particularly on supporting the development of partnerships (known as Voluntary Partnership Agreements or VPAs) with a number of countries in Africa and Asia – currently Cameroon, Central African Republic, Congo Brazzaville, Gabon, Ghana, Indonesia Liberia, Malaysia and Vietnam.

More information on the FLEGT Action Plan, Voluntary Partnership Agreements and the activities of the EFI FLEGT Facility are available at www.euflegt.efi.int.

Asia FLEGT Focuses on Fostering Good Governance and Legal Trade in South East Asia

In November 2008 EFI signed a grant agreement with the European Commission on new 'regional Asia FLEGT Support Programme' (FLEGT = Forest Law Enforcement, Governance and Trade). Co-funding will be provided by DFID and GTZ/BMZ.

Asia FLEGT is focusing on fostering good governance and legal trade in South East Asian countries including China. The specific objectives are (i) to address gaps in FLEGT relevant information collection and provision of networks in Asia, (ii) to strengthen key institutions for improved forest governance at the regional level, and (iii) to invest in customs capacity to efficiently manage regional trade in legal timber and exclude illegal timber from the legitimate trade.

The programme will be executed under the umbrella of EFI's EU FLEGT Facility. It will be run by a small EFI management unit in Kuala Lumpur in close collaboration with a wide range of partners likely to include CIFOR, FERN, Forest Trends, ProForest, ASEAN-German Regional Forest Programme, Tropical Forest Trust and TRAFFIC Asia. The four-year exercise runs with a six million euro budget.

Niina Verkerk

Development and Marketing of Non-Market Forest Products and Services

Robert Mavsar, Sabaheta Ramcilovic and Marc Palahí | EFIMED
Gerhard Weiss | University of Natural Resources and Applied Life Sciences (BOKU), Austria

The importance of sustainable management of non-market forest goods and services is currently reflected in a number of EFU policy documents. Also, EU Forest Action Plan places the valuation and compensation for non-market forest goods and services as one of its 18 key actions. A recent survey shows that taxes and subsidies are the most frequently used financing mechanisms in the EU Member States to support these and other similar strategies.

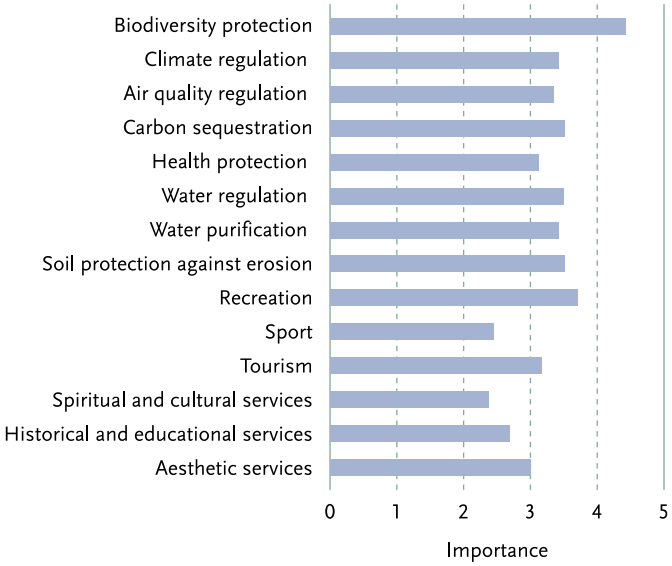
The importance of sustainable management of non-market forest goods and services has increased during the last few years. This is also reflected in a number of policy documents within the EU. The new EU Rural Development Regulation speaks about the "non-productive investments", as investments to enhance the public amenity value of forests. The stakeholder consultation process within the EU Forestry Strategy and the report of the strategy's implementation identify the issue of creating markets for currently non-market forest goods and services as an emerging issue. Finally, the EU Forest Action Plan (2007–2011) places the valuation and compensation for non-market forest goods and services as one of its 18 key actions.

As a response to the challenges, presented in the Forest Action Plan and implementation of the key action for valuation and compensation for non-market forest goods and services the EC launched the FORVALUE study. The study aimed to acquire summarised information on the state-of the-art in classification, characterisation and valuation of non-market forest goods and services. It also sought to find whether the development on theoretical aspects of environmental valuation over the last decades have been, or could be, translated into operational schemes and mechanisms for valuation and compensation for non-market forest goods and services, used as policy instruments. Finally, the study intended to create a foundation for discussion and policy conclusions on the feasibility of application of economic instruments for encouraging and supporting the supply of non-market forest goods and services.

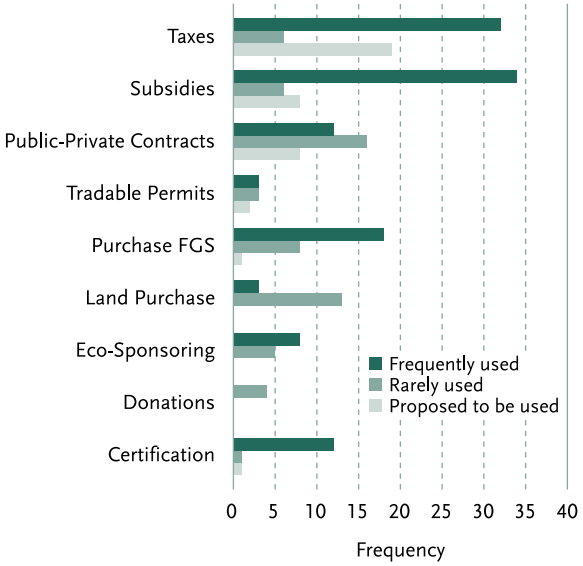
Non-market forest goods and services

It is widely recognised that forests are of high importance for the human wellbeing. The number and variety of forest goods and services is big and constantly changing as new goods and services are appearing or already existing ones are used in new ways. The reasons for this are the constantly changing uses and importance the society ascribes to different forest goods and services.

According to a survey conducted among national experts of the EU-27 Member States biodiversity protection, recreation, carbon sequestration and watershed services are considered as the most important non-market forest goods and services at the EU level. However, the importance of forest goods and services may vary between different stakeholders.



The most important non-market forest goods and services at the EU level are related to biodiversity protection and climate and air quality protection.



The use of different financing mechanisms varies in the EU Member States.

Nevertheless, the access to non-market forest goods and services is mainly unrestricted and free. This means that forest owners receive no monetary compensation for their provision, and thus may be less inclined to manage their forest in a way that generates socially desirable quantity/quality of these goods and services. One of the possible solutions for this problem is to apply financing mechanisms, however this requires knowledge on the values of these goods and services.

Valuation of non-market forest goods and services

Even if some of the methods for the valuation of forest goods and services are still relatively new, in the last decade the methodology and knowledge on these methods have improved considerably. When these methods are applied according to good practice standards and their limitations are carefully considered, they provide sound estimation of economic values of all types of forest goods and services.

The estimated value of a certain non-market forest good or service reflects the benefits perceived by the society. This value can be applied for, e.g.: raising public awareness about the contribution of the good to the social welfare; justifying the investment into certain type of forest management; supporting land use decisions; comparing costs and benefits from alternative projects or programmes, etc. However, the amount of compensation is a subject of negotiation between the provider and the beneficiaries and in general should be based on the forgone income or additional costs that the provider has to bear due to the provision of the non-market good/service.

Financing mechanisms for non-market forest goods and services

Non-market forest goods and services are often positive externalities of forest management or un-managed forests. They commonly have – to a higher or lesser degree – public good characteristics whereby they lack excludability and rivalry. This means that if users cannot be excluded from forest benefits (e.g. dispersed recreation in forest landscapes) and/or if users do not compete for resources (e.g. landscape amenities or protective functions) it is difficult to market them.

Two types of processes may increase marketability: the "transformation" of the goods or services with changes to their institutional properties (e.g. property rights or contractual agreements) and the "product development" (e.g. provision of complementary/additional goods and services, marketing promotion, changes of existing contracts, etc.). Furthermore, policy and social aspects are very important for the question, in how far forest products and services are marketed and in how far financing mechanisms may be used for their enhanced provision. The study of case examples shows that policy frameworks, stakeholder involvement and social acceptance belong to the most important factors for the success of any type of financing mechanisms.

According to a survey conducted in the FORVALUE study, taxes and subsidies are the most frequently used financing mechanisms in the EU Member States. Public-private contracts, purchase of forest goods and services, eco-sponsoring and certification are also of some significance. Other financing mechanisms, i.e. tradable permits, land purchase, land lease and donations, are found only in some countries.

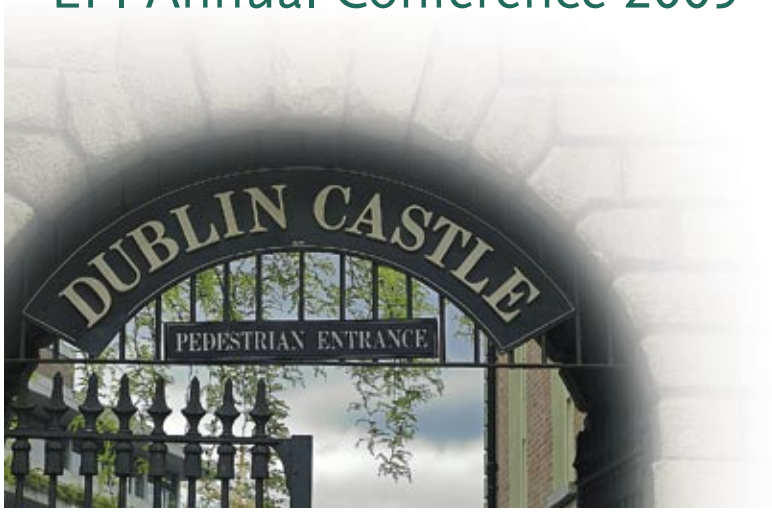
FORVALUE – Study on the Development and Marketing of Non-marketed Forest Products and Services was commissioned by DG AGRI of the European Commission and co-ordinated by EFI Mediterranean Regional Office EFIMED, with Alterra (the Netherlands), University of Natural Resources and Applied Life Sciences, BOKU (Austria), Confederation of European Forest Owners (CEPF) and Department of Forest Economics, University of Helsinki (Finland), as its partners.

The study report will be available soon at the DG Agriculture and Rural Development website http://ec.europa.eu/agriculture/fore/publi/index_en.htm

Edward White / www.fotolia.com

Welcome to Dublin!

EFI Annual Conference 2009



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Dublin is a city of over a million people with a high percentage of its population under thirty years of age. It is a place where good conversation, wit and laughter are prominent traits among its citizens. Even a casual acquaintance can develop into friendship.

Dublin is a delight to explore. The streets are steeped in history, where every visit becomes a journey of discovery. Most of the city's main attractions are within walking distance of the city centre. It is a city that cannot be easily quantified; measurements don't suit it. It is a place of energy, emotions and talk, so it's time for you to come and discover for yourself what makes it a favourite city for many.

The conference (3 September) and scientific seminar (4 September) will take place in Dublin Castle. A centre city location, it dates back to the 10th century when Dublin became an important Viking settlement. From the thirteenth century until the early twentieth century Dublin Castle was the seat of British rule in Ireland and became the city's most important building. Throughout the centuries it was the focal point of social and political power on the island and became synonymous with intrigue and influence. Today it has been transformed into a place of national prestige.

There is an abundance of hotels within easy walking distance of Dublin Castle.

The field trip to Wicklow, south of Dublin, will take place on 5 September. The trip will include Avondale, the homestead of Parnell a prominent nineteenth century Irish parliamentarian and the birthplace of modern day Irish forestry. The wooded hills of Wicklow provide a scenic backdrop to the ruined monastic settlement of Glendalough while, close by, woodlands of native and exotic species is likely to be sources of lively discussion. The objectives of the field trip will be to provide a memorable visit to one of Ireland's most wooded and scenic locations, a glimpse at its historical past and an opportunity to consolidate friendships.

Forest Ecosystem Management in the 21st Century

Scientific Seminar, 4 September 2009

The changing view of the forest and its contribution to society has placed increasing emphasis on the wide range of goods and services it offers. The Scientific Seminar will address the multiple benefits which the forest can provide. The mix of invited speakers, international and Irish, will cover some of the most important issues facing forest researchers, managers and policy makers today.

Antoine Kremer, INRA, Bordeaux will discuss the evolution of trees under the influence of climate change. Antoine was awarded the prestigious Marcus Wallenberg Prize in 2006 for his outstanding work on the evolution, organization and distribution of oak. Climate change policy and Irish forestry will be the subject of *Kevin Black's* presentation, while the related topic of the carbon balance in plantation forests will be covered by another Irish scientist, *Ken Byrne,* of University College Cork. *Niels Elers Koch,* Vice President of the International Union of Forest Research Organizations and Director General of the Danish Centre for Forest, Landscape and Planning, University of Copenhagen, and his co-author, *Frank Søndergaard Jensen,* will consider the topic of forest recreation and human health in plantation forests. The development of forest research in Ireland will be discussed by *Eugene Hendrick,* Director of COFORD, the National Council for Forest Research and Development. The changing demands on the forest education sector will be the theme of *Annette Schuck,* University of Joensuu.

EFI Regional Offices Move Forward

EFI's new Regional Offices have been actively preparing for the launch of their activities. One by one, they are ready to take up their roles in the core of EFI network.

EFICENT kicked off in January

The start of the year witnessed the gradual start of the Regional Office in Central Europe – EFICENT. The funding agreements with German donors were signed in December, and the activities are gradually starting now in Freiburg. Funding agreement with the French donors is under preparation, as well. An information event of EFICENT activities will be held on 3 April. Mr. *Andreas Schuck* has been nominated as Head of Office of EFICENT as of 1 February. He has previously worked at the EFI Headquarters as Programme Manager of Research Programme Forest Resources and Information for the past 10 years.

Ms. *Karoline Öhler* is currently supporting EFICENT in administrative issues.

EFIATLANTIC launch in February

The EFI Regional Office EFIATLANTIC was launched in Bordeaux, France, on 23 February. EFIATLANTIC is the third EFI Regional Office to start its activities. It is based in Bordeaux, France, and it will concentrate its activities in Portugal, Atlantic Spain, Atlantic France, Ireland and the UK. The general theme of EFIATLANTIC is the sustainable management and competitive utilisation of planted forest resources.

The planned activities in the next five years (2009–2013) will contribute to three main research directions and topics identified in EFI strategy:

(1) Effects of forest management and the forest value chain on economic, environmental, social and cultural sustainability in Europe.
(2) Impacts of climate change and other (a)biotic disturbances, and development of adaptation and mitigation strategies in forest management.
(3) Competitiveness of forest resources for energy and material products in relation with to other natural resources.

The launch of EFIATLANTIC took place in conjunction with a REINFFORCE project meeting and IEFC General Assembly. The REINFFORCE project aims at establishing and monitoring permanent research infrastructures on climate change adaptation of forest in the Atlantic region spanning from Portugal to UK.

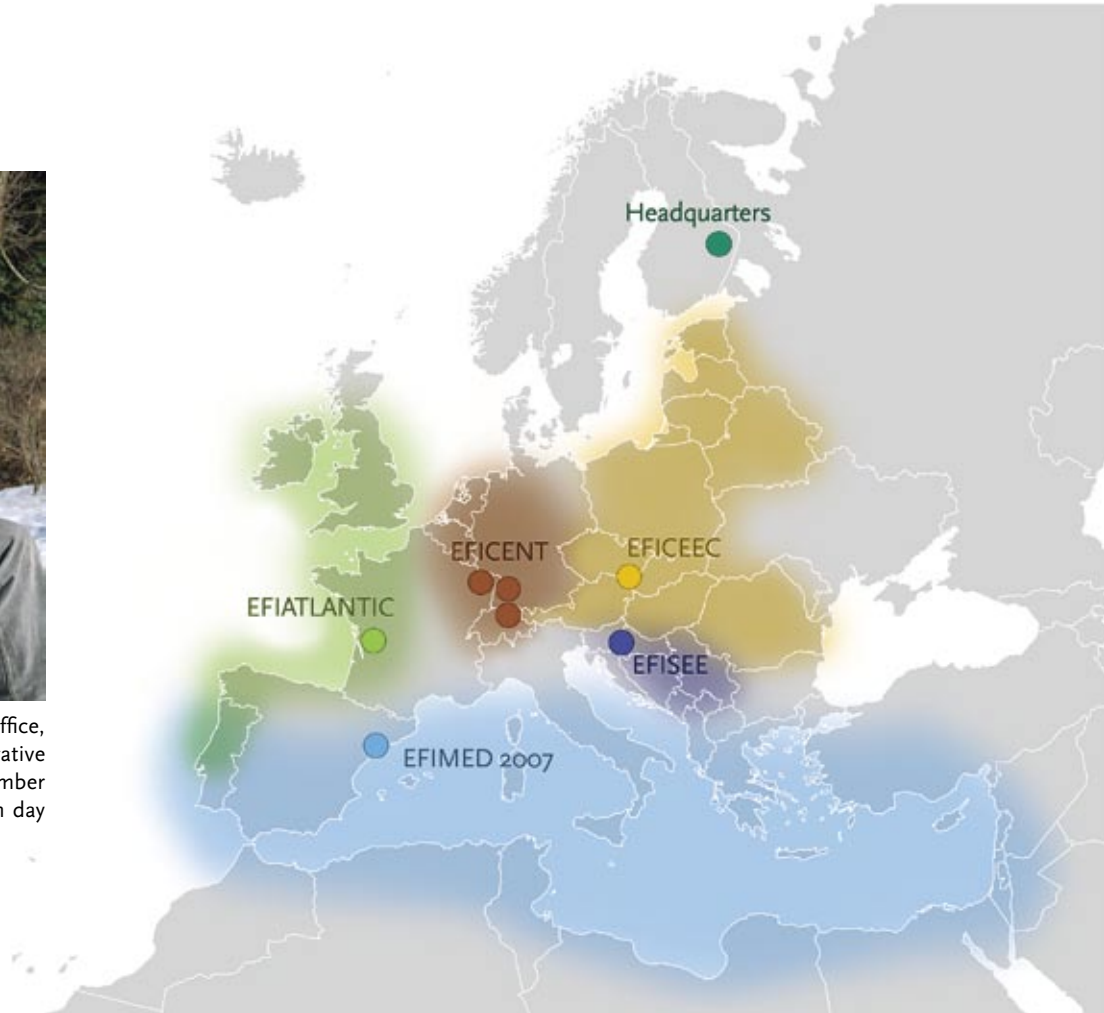
EFICEEC and EFISEE follow in mid-year

The name of EFICEEC located in Vienna, Austria has been agreed on. It was formerly known as EFICEE during the proposal phase of Regional Offices. EFI Director, Prof. Dr. *Risto Päivinen,* visited Vienna and met the representatives and donors of EFICEEC in early February.

Regarding EFISEE in Varaždin, Croatia, the research agenda is under active development. The aim is to have it finalised for the meeting of the Scientific Advisory Board of EFI in early March, with an RO launch possibly in early June.

Stuart Dedrick

Andreas Schuck (back), Head of Office, and Karoline Öhler (front), Administrative Assistant, of EFICENT invite EFI Member Organisations to EFICENT information day on 3 April.



Event Calendar

EFI Events

EFIMED Annual Progress Meeting and Scientific Seminar: Mediterranean forests in the context of integrated management of land resources: soil, water and fodder
29 April–1 May 2009
Marrakech, Morocco

EFORWOOD week, spring 2009
4–7 May 2009
Freiburg, Germany
(open only to project partners by invitation)

Joensuu Forestry Networking Week 2009: Fighting Climate Change by adapting Forest Policy and Forest Management in Europe
24–29 May 2009
Joensuu, Finland

EFI 2009 Annual Conference
3 September 2009
Dublin, Ireland

Scientific Seminar in the connection to the EFI Annual Conference: Forest Ecosystem Management in the 21st Century
4–5 September 2009
Dublin, Ireland

EFORWOOD Week, autumn 2009
21–22 September 2009
Uppsala, Sweden
(open only to project partners by invitation)

Shape Your Sustainability Tools – and let your tools shape you (EFORWOOD –final conference)
23–24 September 2009
Uppsala, Sweden

EFI Associated Events

Forestry, Wildlife and Wood Sciences for Society Development
16–18 April 2009
Prague, Czech Republic

International cooperation in the forest sector: balancing education, science and industry
2–5 June 2009
Yoshkar-Ola, Russia

Further information
Ms. Ulla Vänttinen | Event and Project Officer | European Forest Institute
Tel. +358 10 773 4306 | Fax +358 10 773 4377
Email: ulla.vanttinen@efi.int | www.efi.int

Brita Pajari, EFI's Conference Manager is on sabbatical leave until 12 January, 2010.

International conference

Shape your Sustainability Tools – and Let your Tools Shape you

23–24 September 2009
Uppsala, Sweden

The conference will bring together researchers, policy makers and practitioners from all over the world in discussion about Sustainability Impact Assessment of the Forest-based Sector. Around the globe, tools for analysing sustainability are being developed to help us make better choices. One of the conference focus areas will be on the EFORWOOD project main outcome, the ToSIA tool, a dynamic sustainability impact assessment model that analyses environmental, economic, and social impacts of changes in forestry-wood production chains, using a consistent and harmonised framework from the forest to the end-of-life of final products. It will also be an opportunity for combining experiences and expertise with other EU Integrated projects (SENSOR, SEAMLESS and PLUREL) that are devolving similar tools to support decision making on policies related to various areas of science, such as land use, environmental economics, socio-economics and landscape research.

Further information
www.eforwood.org

International Conference of Young Scientists

24–30 May 2009
Kornik, Poland

For the past eight years, the State Forest University has organized an annual International Conference of Young Scientists. In 2008, the event took place in the very South of Russia, in the capital of Winter Olympic Games of 2014, Sochi. All the conferences have been successful and attracted a lot of interests from all over Russian and foreign institutes, universities and scientific schools. The number of participants is increasing every year and last year it was more than 130. Such cooperation and communication has been found very useful for young scientists from all over the world.

Further information
www.mgul.ac.ru

International Conference

International Cooperation in the Forest Sector: Balancing Education, Science and Industry

Yoshkar-Ola, Russia
2–5 June 2009

The conference provides an opportunity to discuss recent trends and developments in forest education, science and industry in Europe and Russia in the context of a globalised economy. This conference targeted for foresters, scientists, students and environmentalists will deliberate how collaboration between science, education and industry can be improved, for the benefit for the forest sector.

Topics to be addressed will include innovative techniques and practices for sustainable management of forest resources, enhancing the various forest functions, and maintaining forest ecosystems. The organisers therefore call for presentations in various fields related to sustainable forest management, to be given both forest scientists and forestry practitioners.

Deadline for the registration
March 15, 2009

Further information
http://tempus.marstu.net/conference/eng/main.html

Expected Climate cHange and Options for European Silviculture – ECHOES

ECHOES was launched in May 2008 with the main objectives of mobilizing and integrating the existing scientific knowledge on climate change and options for silviculture for European forest policymakers and managers. There are three working groups on impacts, adaptation and mitigation.

One of the aims of ECHOES is to establish active dialogue between the scientific community and the policy-makers on not only what is known about climate change and its impacts, adaptation measures and mitigation but also on the unknown. The main unknowns, or needs, are currently the large scale effects on socioeconomics, climate models, vegetation models and managing sequestration.

Further information
http://www.gip-ecofor.org/publi/page.php?id=2&rang=0&domain=37&lang=en_GB

MOTIVE – Models for Adaptive Forest Management

The project MOdels for AdapTIVE forest Management (MOTIVE) is a large-scale integrated project in the 7th Framework program of the EU that evaluates the consequences of the intensified competition for forest resources given climate and land use change. The project focuses on a wide range of European forest types under different intensities of forest management. In particular, MOTIVE examines impacts with respect to the disturbance regimes determining forest dynamics.

MOTIVE seeks to develop and evaluate strategies that can adapt forest management practices to balance multiple objectives under changing environmental conditions. The evaluation of different adaptive management systems will take place within a scenario analysis and a regional landscape framework. A wide range of possible scenarios will be taken into account from optimistic predictions ("no major change for forest ecosystems") including possible opportunities offered by climate change (e.g. increased tree growth in northern areas) to worst case scenarios ("extreme deterioration of the growth conditions for trees") on different time scales (short-, mid-, long term). The main forest types in Europe for the most important bioclimatic regions will be covered.

MOTIVE is a project that encompasses 20 partners from 14 European countries (with EFI being one of the larger partners) and has an overall budget of almost 9 million Euros, from which 7 million will be paid as EU contribution. The project is coordinated by the Forest Research Institute of Baden-Württemberg (FVA – Prof. Dr. *Marc Hanewinkel*) with a duration of 4 years. The official start of the project is planned for 1st of May 2009.

Stay up-to-date with EuroForest Portal News – forestportal.efi.int/

The EuroForest Portal at forestportal.efi.int/ now has an RSS feed for its news items. This feature enables users to be informed automatically when new items appear in the Portal News. The Portal now receives more than 6000 visitors (and increasing) every month, so if you have news items that you want to announce to a wider audience please send the information to the portal team (forestportal@efi.int). The news service covers items of direct interest to the forest and forest products sector, and also items of more general environmental interest. The geographic scope for news items is generally the European (or a sub-region of Europe) level, but items of global, national and sub-national interest are also noticed. The team reserves the right to decide which items will be published.

Call for bids for the EFI 2011 Annual Conference Week

The Annual Conference is the central decision-making body in the EFI organisation. It takes place during the EFI Annual Conference Week. The Week is organised in co-operation with EFI member organisations.

The call for bids for the next EFI Annual Conference Week taking place in 2011 is now open!

The week gathers approximately 180 participants, the numbers in individual meetings varying from 10 to 150 participants. If your organisation is interested in hosting the Conference, please find the application form at http://www.efi.int/portal/members/membership_service/annual_conferences/. Please submit the proposals to *Satu Ikonen-Williams* (satu.ikonen-williams@efi.int) by 15 May 2009.

DRESDEN 2010 | **DUBLIN** 2009 | **ORVIETO** 2008
WARSAW 2007 | **KERKRADE** 2006 | **BARCELONA** 2005
BANGOR 2004 | **JOENSUU** 2003 | **COPENHAGEN** 2002
BORDEAUX 2001 | **LISBON** 2000 | **ITTINGEN** 1999
ZVOLEN 1998 | **GEMBLOUX** 1997 | **FREIBURG** 1996
TAMPERE 1995 | **JOENSUU** 1994

EFIMED Annual Meeting 2009 in Marrakech

EFIMED will organize its Annual Meeting and its related Scientific Seminar, dealing with the topic of: Mediterranean forests in the context of integrated management of land resources: soil, water and fodder.

The conservation and proper management of Mediterranean forests have crucial effects on the sustainability of other resources like soil, water, pasturage and wildlife. However, improper management of forest resources, forest degradation due to overgrazing or deforestation can result in (i) soil degradation and in the worst case in desertification; (ii) the disappearance of vegetation used as fodder; (iii) the reduction of water quality, or (iv) the reduction of forest goods and services. In addition, due to the dynamic and interrelated nature among forests, grazing, soil conditions, and water flows, proper land management should count with this trade-off.

The meeting will take place from 29 April to 1 May 2009 in Marrakech, Morocco, in cooperation with ENFI. Programme and information on registration available on the website: http://www.efi.int/portal/about_efi/organisation/regional_offices/efimed/networking/efimed_annual_meetings/efimed_am_2009_-_marrakech/

françoise bro / www.fotolia.com

Water and Forests: Conclusions of the Conference

The Conference held in October 2008 became a meeting point of specialists on meteorology, forestry, hydrology, water management and climate change.

Speakers presented their views on the multiple interactions among water and trees, which show that traditional ideas need to be revised with new scientific findings in order to move away from the "4Ms": myths, misunderstandings, misinterpretations, and misinformation. The discussions during the event made it clear that holistic approaches in the management of forest and water resources are needed to optimize their use and ensure their sustainability. Cause-effect relations are very complex and with many open questions not answered yet, which are becoming even more relevant in a context of a changing society and climatic conditions.

While future precipitation patterns show more uncertainties, the most common picture foresees a Mediterranean area with less rainfall; in contrast temperate areas will become wetter. Forests reduce the erosion power of drops with their canopies, but in turn part of them are intercepted. Once on the ground, root systems contribute to the water availability in soil, but at the same time they consume such water for the vital processes of the tree. Fixing 1g of CO_2 has a considerable cost in terms of water (an average of 500g of H_2O), what should be considered when planning new plantations to mitigate GHE. Climate change models coincide in an increase of temperatures. This will affect vegetation by inducing more evapotranspiration and enlarging the growth periods, which, in a Mediterranean context where water is the limiting factor, does not always mean more Carbon sequestration: if plants do not find water, cells start consuming their own carbohydrates reservoirs, driving them to a weakening situation, and thus becoming more sensitive to pests or droughts.

Societal changes also influence on water and forests. Rural depopulation entails to growing forest areas which require more water than shorter types of vegetation. Appropriate silvicultural treatments can help controlling such water expenditure. Development of tourism, irrigation for food production jointly with the increasing demand on drinking water lead to a rising consumption of the resource.

Forest managers will face all these challenges, and need to find common solutions together with water managers, while society should be duly informed for overcoming nowadays' limited public perception. Understanding all these trade-offs implies further efforts in basic and applied research.

Conclusions of the conference are available on EFIMED website.

New Project on Assessing Economic Impacts of Forest Fires

The EFI Mediterranean regional Office – EFIMED was awarded by the Joint Research Center JRC with the project "MASIFF – Development of a methodology for the analysis of socio-economic impact of forest fires and economic efficiency of fire management". The main objective of this project is to develop and implement a standardised methodology for the assessment of economic impacts of forest fires and estimation of economic efficiency of fire management measures.

The project started in December 2008 and will run for two years. *Robert Mavsar,* from EFIMED, will lead of the project, which is carried out in cooperation with the Italian Academy of Forest Sciences (Italy), Forest Technology Centre of Catalonia (Spain), Instituto Superior de Agronomia (Portugal), National Agricultural Research Foundation (Greece) and the external expert *Armando González* from the USDA Forest Service, USA.

Mediterranean Forest Research Agenda

As discussed during the last EFIMED annual meeting in Orvieto, Italy, EFIMED has taken the lead in drafting a Mediterranean Forest Research Agenda (MFRA) that describes a common vision for forestry in the region in the period 2009–2020 and main research priorities to develop it.

The European Forest-Based Sector Technology Platform (FTP) has provided the framework for the Mediterranean forest research community to develop the MFRA as part of the Strategic Research Agenda (SRA) in order to highlight the main Pan-Mediterranean scientific challenges as well as the scientific priorities, objectives and outcomes to address them. Therefore the MFRA will be an integral part of the European Forest-Based Sector Technology Platform (FTP) process. The decision made by the FTP steering body clearly gives a high profile to MFRA.

The Agenda is now under a consultation process.

a) In countries (in particular the Mediterranean ones) with a FTP/National Support Group (NSG), this instance will be given an information (written and oral, during a next NSG meeting).
b) In other countries, a focal point (an EFIMED member) should organise a consultation meeting with the local stakeholders.

Later, the EFIMED Advisory Group will then compile all comments and feedback, improving the draft document.

On this basis, it will be possible to use the MFRA for both:

- attracting more national and international resources and funding for research on Mediterranean forest;
- implementing research programmes and projects in a coordinated efficient and effective way.

EFI Becomes a Founding Member of the Euro-Mediterranean University (EMUNI)

Within the framework of the Union for the Mediterranean and the Barcelona Process, the Euro-Mediterranean University (EMUNI) has been established in Slovenia. EFI is one of the founding members of the University. EMUNI's mission is to promote higher education and research in the Euro-Mediterranean region contributing to the general strengthening of the Barcelona Process.

The founders of EMUNI are universities, networks of universities, higher-education and research institutions – a total of 113 from 32 countries. As one of the founding members of the University, EFI has representation in the Assembly of the University: Dr. *Marc Palahí* from EFIMED will be the EFI representative.

EMUNI programme in this year will focus on academic activities, such as performing four post-graduate programmes (EMUNI label) and doctoral research seminars.

Further information
www.emuni.si

Perspectives and Limitations of Higher Forestry Education in a Unifying Europe

Annette Schuck

The Bologna Declaration was signed in 1999 by 29 European countries committing themselves to build a European area of higher education that is competitive on a global scale. The objectives are to establish a common framework of degrees, to implement a Diploma Supplement, to introduce undergraduate, graduate and postgraduate levels, a common credit system also covering lifelong learning activities, a European dimension in quality assurance, with comparable criteria and methods, and to ensure free mobility of students and teachers.

In my recent PhD thesis, I compared the implementation of the Bologna objectives in higher forestry education at the Finnish universities of Joensuu and Helsinki to those in three other European countries (Germany, Austria and The Netherlands) and also to agricultural degrees in Denmark. Limitations of higher forestry education show some striking parallels. In Finland and Germany – both countries with a large number of Polytechnics – the introduction of a labour-market relevant Bachelor degree has caused concern. Employability of graduates from forestry degree programmes is a problem in all surveyed countries. In most countries the numbers of female and foreign forestry students have increased dramatically during the last 15 years. This adds to employment problems, since women and foreigners are more often subject to unemployment or temporary and part-time employment.

In all four countries, forestry faculty and degree names have been changed and broadened to encompass a larger area of expertise. This coincided with a broadening of the forest sector to the forest cluster or the wood chain and a wider set of competences being considered necessary. It often remained unclear, however, if the content of the degree programmes had indeed been changed accordingly.

As the Bologna Process formally ends in 2010, it will be interesting to see which of its objectives have been successfully implemented until then and how the work started 10 years ago will continue. As it seems unlikely that the importance of higher forestry education will decrease in the future, universities may have to face the challenge of attractiveness for students to enroll and graduate and competitiveness in terms of curricula. In this context, a sound and systematic approach to quality assurance will play a major role. It will be particularly important to start an intensive dialogue with all relevant stakeholders – staff, employers, students, graduates, forest owners, etc. – on which competences are perceived important for future graduate from forest science programmes.

European Forest Monitoring Far from Being Complete

Saku Ruusila

Michael Köhl

The United Nations Climate Change Conference, held in Poznań, Poland, last December, reconfirmed the future problems of human societies arising from climate change. In the forestry sector, the vulnerability and adaptation of forests to climate change render prognoses on future developments difficult and deteriorate the extensive knowledge of forest ecosystem functions and tree growth gained in the long history of forest research and forest management.

In addition to climate change, forestry is facing a diversity of challenges such as the increasing demand for timber as a renewable resource, the need to protect forest habitats and their biological diversity, changing flow of trade driven by globalisation, land-use change, or damages caused by storms, insects and forest fires. All this has exposed forestry to an increased public perception.

The demands of different stakeholders are to some extent contradictory and result in conflicts regarding the appropriate management of forests. For example, those focusing on habitat protection propagate the abandonment of timber harvesting while others claim the sustainable utilization of timber in order to meet the demands for renewable resources. The committed discussions on the "correct" management of forests carry the difficulty that each perspective seems to be per se coherent. Part of the problem is certainly the fact that forests are not an all-in-one device suitable for every purpose. But often the line of argument is restricted to a specific perception and does not take into account the implications as a whole.

Here forest monitoring comes into play. The current MCPFE report on the State of Forests in Europe 2007 revealed a specific problem. The report utilized information from national forest inventories and from the EC/ ICP-Forests forest condition monitoring as main data sources for the 6 pan-European criteria and 35 quantitative indicators. A detailed analysis of the submitted data showed that the overall completeness of the requested information was 57%. The highest degree of completeness was achieved for the indicators "increment and fellings", "forest area" and "protective functions – soil, water and other ecosystem functions", while lowest levels of completeness were found for the indicators "deadwood" and "services". These findings can be regarded as an indication for the still unbalanced provision of data on the entire set of information needed to describe the sustainable management of the multiple functions of forests.

These information gaps are not solely the result of a lack of methodological approaches in forest monitoring. In the recent decade much emphasis has been put on the development of schemes to assess the non-timber functions of forests. Now these approaches need to be implemented in forest monitoring programmes. In addition, the analysis of forest monitoring data should not be restricted to a mere description of the current state and changes of forests, but be expanded by epidemiological analyses and causal inference in order to get further insight into forest ecosystem functions and processes.

The European National Forest Inventory Network (ENFIN) and the FUTMON project, which was currently launched by the European Commission and involves 44 European forest research institutions, are promising initiatives to facilitate the provision of a holistic view on European forests. This holistic view is urgently needed in times of competing demands concerning the wood and non-wood functions of forests.

Michael Köhl is a member of EFI's Scientific Advisory Board, chair of ICP-Forests, and Head of the Institute for World Forestry, Hamburg, Germany.

EFI news

EFI News is the newsletter of the European Forest Institute.

Editor-in-Chief: Risto Päivinen
Managing Editors: Minna Korhonen and Anu Ruusila
Layout: Jouni Halonen / Kopijyvä Oy
Cover photo: Saku Ruusila
ISSN: 1236-7850
1458-4255 (online)

Contributions and Announcements
Article ideas, letters to the editor and requests for advertising information should be sent to publications@efi.int

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EFI News is free of charge. In order to receive a copy, please send your full address to the European Forest Institute. The electronic version, as well as back issues, can be downloaded from www.efi.int

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