IUFRO European Congress

Warsaw Agricultural University, Poland

September 6-8, 2007

FORESTS AND FORESTRY IN THE CONTEXT OF RURAL DEVELOPMENT

SCIENTIFIC SEMINAR

PRELIMINARY INFORMATION

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PLENARY SESSION I

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Improving forest-science interface in support of rural development

Thursday - Sept. 6th, 11.30 - 14.00, Crystal Aula (Old Campus)

Moderators: Frits Mohren, Stefan Zajaczkowski

KEY-NOTE PRESENTATIONS:

Don Koo Lee *Prof., IUFRO President*

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Forest-based entrepreneurship and rural development in Europe »

Robert Jandl ***Dieter Stohr*** *Ass. Prof., IUFRO Dep. Coordinator "Forest Environment" ...*

Forests and rural development in the light of global change »

Hans R. Heinimann *Prof., IUFRO Coord. "Forest Operations Engineering & Manag."*

Perspectives on forest operations research and management »

Rural development towards a bio-based economy - the contribution of forest research

Konstantin **von Teuffel**

Forest Research Institute Baden-Wurttemberg, Germany

Keywords:

Current European society relies heavily on fossil-based raw materials not only for fuel and energy provision but also for a multitude of other basic materials such as plastics, chemicals and other refinery products. This presentation describes possibilities of turning this societal trend away from it current focus and into a more sustainable bio-based economy. In such an economy bio-based products can increasingly be used as a source of raw material for a multitude of purposes. Forests and wood materials can contribute significantly to such a development in many respects. The use of wood in building and living should therefore be increased; woody materials are increasingly important for energy purposes but also as raw material for chemicals and new, innovative materials. This type of development would clearly be an opportunity for the further development of rural areas since it is here that both forest based raw materials as well as agricultural crops are grown, harvested and partly processed.

In order to trigger, support and optimise such a development, many open questions need to be addressed by the European scientific community. The EU Commission has put this idea at the top of the 7th Framework Research Programme. In response to that, stakeholders in the forest based sector have formed the "Forest Based Sector Technology Platform" in order to coordinate research activities within the whole sector. This platform is clearly an industry driven initiative broadly supported by the scientific community of the whole sector.

There are three main challenges to be tackled:

- to optimise the forest-wood-supply-chain and develop new products from wood as well as agricultural materials,

- to assess and develop the contribution of bioenergy to a bio-based economy,

- to take into account the challenges brought about by changing climatic conditions.

The presentation shows the current German approach with some examples to illustrate relevant research fields. If the sector wants to be successful, the involvement of stakeholders is critical and should be actively pursued.

Forest-based entrepreneurship and rural development in Europe

Anssi **Niskanen**

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Keywords: small-scale forestry, NWFP, enterprise, entrepreneurship, rural development

At EU level there are in the region of 15 million small-scale forestry holdings covering in excess of 37 million hectares of land. Small-scale forestry holdings are elementary suppliers of raw material for local small-and medium size wood and non-wood processing industries and a basis for many environmental services and rural development opportunities.

Enterprises are best able to adopt on the demand changes of consumer tastes and they provide a promising opportunity to forest-based rural development if the goods and services firms produce can satisfy the needs of especially urbanised populations.

But how prepared the forest sector is to develop new entrepreneurship and in this way support rural economic development? This question was examined in a COST Action E30 ‘Economic integration of urban consumers’ demand and rural forestry production’ in 2002-2006 with 21 European countries participating. This paper reports the main conclusions of the Action with respect to its working groups on small-scale forestry, small- and medium size enterprises (SME) in wood processing industries and non-wood forest products and services (NWFP&S)

1. Opportunities of small-scale forestry to support timber industries are under a threat of decline.

Social changes and the decreasing timber revenues have led in many European countries to the abandonment or non-management of forests and to decreasing efforts in forest management. At the same, forest owners’ attitudes and goals have diversified from timber production objective towards the management of forests for economic security, consumption of various NWFP, environmental protection or some intangible services like peace and quiet. Institutions like forest owners’ associations (FOA) can have a vital role in motivating private forest owners for wood and NWFP sales for different forest-based supply chains. However, since the forest owners have a broad spectrum of values and attitudes, the possibilities of the traditional FOAs to support wood supply to downstream industries may decrease unless new ways to motivate forest owners to manage their own forests beside financial income are not found.

2. SMEs in wood product value chains should have a tighter business focus

Cost minimisation strategy applying positive scale economies has dominated the business strategy of standardised wood product industries. This is insufficient for many SMEs because of their low cost competitiveness compared with larger firms. SMEs in wood-processing industries should therefore focus especially on strategies utilising local demand advantages or niche market potentials. In the secondary wood product industries, for example, SMEs can acquire competitive advantages through craftsmanship skills, traditions as well as abilities to adapt on domestic market specifications and customer tastes.

3. Innovations and marketing of NWFP&S need more institutional support

Even though the demand for the NWFP&S is increasing, there still are many barriers to entrepreneurs and supporting institutions to overcome before the potential can be fully utilised. NWFP&S sector is traditionally product oriented, which is strategically peculiar as the long distances from rural production areas to the customers would suggest highest orientation in the marketing. Also peculiar is the low level of segmentation in the NWFP&S sector. To be able to develop high quality products or services to the demanding customers, it would be essential to target businesses more tightly to the selected customer groups which is even more important considering the wide range of NWPF&S existing in the markets.

Forests and rural development in the light of global change

Robert **Jandl**[a*], Dieter **Stohr**[b]

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[*] *corresponding author*

Keywords:

Following a general demographic trend towards urbanization less people find employment in agriculture and forestry. As a consequence of mechanization and efficient forms of land management less people are required to maintain the economical operation of forest land. However, forestry needs to be more than timber extraction and future opportunities lie in the provision of wood-based products that by far exceed the traditional focus on boards, pulp and paper. An obvious trend is the production of biofuels from biomass.

Not all forest lands are equally relevant for new products. Especially mountain forests of low productivity can only play a marginal role. Their value with respect to ecosystem services such as control of natural hazards, provision of drinking water, carbon sequestration, and scenery needs to be assessed in terms of economical standards, e.g. weighed against alternatives. Claims for direct transfer payments from other parts of the economy or from governments towards forest enterprises for ecosystem services in general are elusive.

The identification of specific benefits from forests for specific purposes of stakeholders are more promising market products. Skilled personnel are required to meet the manifold challenges. The fact that owners of forest land often work in professions outside of forestry bears the danger that forests do not receive the required attention. The propagation of high population densities of bark beetles in some parts of Europe gives evidence for the critical situation. Also the maintenance of forest structures in order to withstand flooding, avalanches, and storms requires a considerable expertise and attention. When land owners are no longer willing or able to ensure the desired status of forests, the forest administration will find itself increasingly in the role of advising forest owners on appropriate and efficient ways of forest management.

Perspectives on forest operations research and management

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Keywords: forest operations, forest engineering, paradigms, future challenges, scientific discipline, historical development

The forest operations engineering and management community has been facing the problem of improving its scientific visibility, realigning its research efforts to the future challenges, and of strengthening its self-confidence. The paper aims at exploring the paradigms that shaped the development of forest operations as a scientific discipline, sketching a vision how forest operations could look like in 2020, establishing a common understanding for future of the discipline, and discussing the major challenges ahead. The investigation identified five periods of steady state development (paradigms) and developed a vision of network-based forest operations systems, built of "self-organizing" cells. It then discusses the challenges that we will probably been faced with in the fields of "harvesting and transportation engineering", "forest operations management", "forest ergonomics", and "forest operations ecology". The study intended to trigger a broad discussion on the future directions of forest operations engineering and management, and to build a basis for a redesign of corresponding curricula in higher education.

PARALLEL SESSION A

Session parallel to Sessions list

Forests and Rural Development in the Light of Global Change

Thursday - Sept. 6th, 15.15 - 17.15, Aula I, Building 34 (Forestry)

Moderators: Andrzej Bytnerowicz, Jacek Oleksyn

*Gerard **Buttoud*** *Irina **Kouplevatskaya***

Rural forest use and management as seen in the international dialogue on forests: global policies versus local practices »

*Jacek **Zajaczkowski*** *Kazimierz **Zajaczkowski***

Farmland afforestations: new goals and guidelines for Poland »

*Alexander **Alekseev*** *Andrey **Selikhovkin***

Rural forested areas as an only background for regional carbon and environmental balance »

*Susan Edda **Seehusen***

Incentives for the production of environmental services as development strategy for the Brazilian Amazon forest »

*Natalia **Khutorova***

Economic and social effects of bioenergy »

Rural forest use and management as seen in the international dialogue on forests: global policies versus local practices

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Keywords: forest policy, rural development, rural uses, farm forestry, international dialogue on forests

The international dialogue on forests pays little importance to rural forests use and management. Only few specific considerations exist on this topic in the major international statements and declarations, which take their origin in the global environmental discourse.

Although, as far as local forestry activities are concerned, the need to stress the social considerations on sustainability calls for a strong linkage between forest practices and rural context, especially in countries where rural activities are an important part of local development. The theoretical construction of integration among ecological, economic and social aspects of durability anyway directly leads to the focus of attention on the dynamics of structuring the forest resource by local users and managers. The ways how rural people consider the forest play a central role in this linkage.

The paper lists the main directives related to rural use and management in some major statements (including Rio Declaration, IPF and UNFF statements, MCPFE, EU Forest Action Plan), and analyses the main directions which are promoted by those concepts.

A gap existing between general policy declarations and prescriptions on the one hand, and local concrete actions on the other, is then identified and characterised, based on examples found in different situations in various countries. An analysis of the reasons explaining such a gap is presented, including:

- the variety of different and contradictory concepts for rural forest management;
- missing consideration of local adaptations in the global view;
- the need for “translators” to transfer the global priorities into the local level needs;
- oppositions created by the different logic of development at global and local scales;
- permanent changes in context work at different speed for global and local levels.

From this assessment, some considerations are driven on the resilience of local systems for rural forest use and management, and a typology of different forms of implementing global forest policies is presented.

Farmland afforestations: new goals and guidelines for Poland

Jacek **Zajaczkowski**[a*], Kazimierz **Zajaczkowski**[b]

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Keywords: agricultural landscape, farmland afforestation, regionalization, planting design

The paper presents the ecological role of trees and shrubs scattered across farmlands (i.e. non-forming forest ecosystems). Both originated spontaneously and planted woody vegetation is considered an important tool which may be used to protect and manage agricutural landscapes.

As the result of overview of ecological research results available for Polish conditions, the shift is postulated from domination of productive to protective functions of such vegetation (e.g. related to climate drying, soil erosion or groundwater pollution). The concept of afforestation needs of agricultural landscape is introduced, and the results are presented of regionalization (delimiting the geographic regions) of dominating farmland afforestation needs.

The specific features of farmland afforestations' species composition as well as spatial and vertical structure are discussed in relation to their potential role. Design guidelines for establishment and examples are presented of new woody structures in agricultural landscapes.

Rural forested areas as an only background for regional carbon and environmental balance

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Keywords: forested rural areas, forest biomass, NPP, GPP, carbon balance

Urbanized areas are net source of CO2 meanwhile natural ecosystems accumulate it in biomass and these flows for regional stability should be in quantitative balance. If for some region natural ecosystems per year accumulates the amount of CO2 equal or more generated by techno system on the same area for same year we may conclude positively about general environmental situation here. Amount of carbon sequestrated by forest ecosystems depends on size and productivity of rural forested lands of region the more these both the better regional environmental status.

Based on this balance it is possible to use such main forested land inventory characteristics as area and mean annual increment as well as information on species composition, biomass composition, species wood and other fractions density for estimation of general environmental stability of analyzed region. General environmental stability (GES) may be described as ratio of total amount of carbon sequestered (TACS) annually by rural forested area of region to total amount of carbon (TACR) released on the same area from industrial sources: GES = TACS / TACR. If GES is more or equal to 1 then the region may be considered as environmentally stable in general from carbon cycle point of view and even input positively into global stability (if GES>1).

Total amount of carbon sequestered (TACS) annually by rural forested area may be calculated by following formula:

TACS = GPP = NPP + R = SUM i=1,n SUM j=1,m S ij * SUM k=1,l C ijk * d ijk * I ijk + R

where GPP – gross primary production, t/hectare*year; NPP – net primary production, t/hectare*year; R – autotrophic respiration, t/hectare*year; S ij – area covered by forest of species i at age j, hectares; C ijk - share of carbon in absolutely dry fraction of biomass k of species i at age j; d ijk – content of absolutely dry matter (density) in fraction of biomass k of species i at age j, t / m3; I ijk – volume increment of fraction of biomass k of species i at age j, m3/hectare*year.

As it easy to realize the above formula for TACS represents the carbon accumulated in net primary production (NPP) of the regional forests and also the carbon meanwhile goes through forest biomass and later released back to atmosphere by biomass respiration (R). This last carbon after it goes through forest biomass becomes natural and also should be included into annually sequestered amount TACS as a characteristic of forest vitality and carbon exchange ability. Forest biomass respiration "laundered" the man-made carbon.

The above formula components not so easy to determine that is why as a first approximation may be used officially reported forest inventory and environmental data. These gives the GES = 1.15 or 115%. So, we may generally conclude about positive input of Leningrad region forested rural areas into carbon cycle and general environmental balance.

Incentives for the production of environmental services as development strategy for the Brazilian Amazon forest

Susan Edda **Seehusen**

University of Freiburg, Germany

Keywords: Brazilian Amazon forests, environmental services, development strategy

The dominant land uses in the Brazilian Amazon forest, based on intensive agriculture, extensive cattle ranching and small scale shifting cultivation are not desirable neither from an ecological nor from a social point of view. The economic advantages are also questionable. The Amazonas forest needs a development strategy capable of providing the local population better life standards and the country good income possibilities at the same time that it conserves the ecological richness and functionality of the forest. In this context, the supply of environmental services seems to be an appropriate alternative, considering that the markets for these services are growing fast and that it would promote the sustainable use of the forest.

Taking into account that it is the rural local people who should implement the activities suggested, a development strategy based on the production of environmental services must be based on many incentives, in order to be adopted. It should cover a big spectrum of mechanisms, which: 1. transmit to the local population the understanding about the functions of the forests; 2. build the capacity of the population promoting the independent work and building knowledge; 3. provide better infrastructure in order to reduce dependence relationships and to enable market access, and; 4. cover the opportunity costs for the abandon of present-day land uses.

This article investigates in how far the socio-economic development of the Amazon familiar rural production (Programa de Desenvolvimento Sócio Ambiental da Produção Familiar Rural na Amazônia) – Proambiente addresses the components cited above being capable of providing a sustainable development strategy for the Brazilian Amazon.

Economic and social effects of bioenergy

Natalia **Khutorova**

Moscow State Forest University, Finance Department , Russia

Keywords:

Current situation on the wood fuel market. The tendency of changing the prices for wood and mineral fuel. Experience of the foreign countries. An infrastructure. Trading platforms, the orders and transactions. The prices dynamic for wood fuel. Traditional fuels prices cycles comparing with cycle of economic development. The role of government in management in bio-energy market. The world market of wood fuel. European Union and BASREC. Market of wood fuel in Russia.

PARALLEL SESSION B

Session parallel to Sessions list

Small Scale Forestry

Thursday - Sept. 6th, 15.15 - 17.15, Aula II, Building 34 (Forestry)

Moderators: Stanislaw Miscicki, Gert-Jan Nabuurs

*Janusz M. **Sowa***

The role of licensing of forest service enterprises in the vocational activation of the population in rural area »

*Gun **Lidestav***

The role of forest owners associations in rural development »

*Anastasia **Stergiadou*** *Daniele **Lubello*** *Raffaele **Cavalli*** *Janez **Krc***

Estimating forest harvesting operations to achieve sustainable rural development in Valia Kyrna (Greece) »

*Lucrecio L. **Rebugio*** *Don Koo **Lee*** *Dudung **Darusman***

Reducing rural poverty through collaborative forest restoration research: the AKECOP experience »

The role of licensing of forest service enterprises in the vocational activation of the population in rural area

Janusz M. **Sowa**

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Keywords: licensing of forest service enterprises, quality of forest services, vocational activation

According to statistical data (by GUS, i.e. the Main Statistical Office), forest services in Poland are performed by over 8 thousand private transactors. As a result of the complex process of privatization of the service sector in forestry, after 17 years of its implementation, private enterprises have almost entirely taken over various forest management tasks in the State Forests (Państwowe Gospodarstwo Leśne Lasy Państwowe). The complexity of privatization processes and varied conditions of their implementation have resulted in a great diversification of the private sector of forest services, ranging from one-man businesses, mostly poor ones, to large companies which employ several dozens of workers, own expensive and modern technological equipment and have specialized administrative and technical staff.

The present study is an attempt at showing the influence of licensing procedures concerning the quality of forest services, performed by Forest Enterpreneur Association (Stowarzyszenie Przedsiębiorców Leśnych), on the vocational activation of the population living in rural areas and on the job stability in this sector of services.

The role of forest owners associations in rural development

Gun **Lidestav**

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Keywords: cooperation, membership and ownership benefits, sensemaking

Almost half of the Non-industrial Private Forest (NIPF) properties and their owners in Sweden are associated to one of the four major Forest Owners Associations (FOA. Besides acting as timber merchants, these FOA also run a number of wood processing industries. Historically, the FOA have played an important role to the development of small-scale forestry and forest farm enterprises by improving the NIPF owners bargaining situation, reducing their costs for forest operations and by providing forestry services. However, by the ongoing urbanization of forest owners and mechanization of forest operations, less and less NIPF owners make their living as a self employed forest farmers while more and more do hire forest contractors for harvesting operations. Thus, the impact of FOA in terms of rural development is no longer as obvious as previous.

Based on resent research of i) NIPF owners identity and values ii) differences between members and non-members in FOA iii) NIPF owner business relations to FOA and iv) perceived benefits of being member and owner of FOA, the contemporary and future role of FOA in rural development will be discussed. Quantitative methods (register analysis and surveys) as well as qualitative methods, such as focus group interviews, have been used for gathering data, which have been analyzed and interpreted by using theories and concepts from economy and sociology as wells as , organizational and communication science.

Estimating forest harvesting operations to achieve sustainable rural development in Valia Kyrna (Greece)

Anastasia Stergiadou[a*], Daniele Lubello[b], Raffaele Cavalli[b], Janez Krc[c]

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Keywords: rural development, GIS, SDSS, human resources, harvesting operations

Mountainous areas, with altitude over 700 m, intense relief and slopes between 16 - 20%, cover 43% of Greece and they are usually characterized by low population density and long-term unemployment. The Greeks have a dependent connection among environment, economy and society as the history illustrates. Many of Greece's historic, cultural landscapes and native ecosystems have been degraded or isolated over the years. There is scientific evidence that Greece's natural/semi-natural forested areas cannot be sustained without watersheds, ridges and other natural corridors that connect its native landscapes and ecosystems. Logging systems are really ancient by using often only mules or horses.

The aim of the work is to estimate how harvesting systems should be technologically upgraded improving forest work and social wellness maintaining at the same time ecological sustainability.

The study area is held at Samarina region, a mountainous area of Northern Pindos in Greece.

Social data were collected with questionnaires and local visits for better understanding of human resources for forest authorities and other administrative informations. DTM, Forest Inventory data and other GIS data have been derived by paper maps and previous studies.

Also a registration of road-net and human resources within the protected area of Valia Kyrna and their contribution as factors for the sustainable development was used.

The development of a Spatial Decision Support System that can concern all the conditions that are need in order to make an estimation of the optimal way of harvest a stand is really a challenge.

A GIS program is a powerful decision support tool in order to give the opportunity to the Forestry offices to choose the optimal way of harvesting a stand and also to realize visually the effect’s of such a kind of work that is going to be held to the inhabitants and to the tourists of the area.

The potential of social and ecological factors is examined as it concerns the promotion of the protected area within sustainable development. Advantages of registration in the form of a spatial tool, especially when many types of information participate, are presented.

Reducing rural poverty through collaborative forest restoration research: the AKECOP experience

Lucrecio L. **Rebugio**[a*], Don Koo **Lee**[b], Dudung **Darusman**[c]

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Keywords:

The ASEAN-Korea Environmental Cooperation Project (AKECOP) showcases creative collaboration in research and development initiatives for forest restoration and rehabilitation involving 10 countries in the Southeast Asian region. Several of the researches being conducted particularly in the Philippines and Indonesia are deliberately aimed at reducing poverty particularly in rural and upland forest communities.

In Indonesia, an action research through local people's participation at the Gulung Walat Educational Forest (GWEF) on the development of agroforestry systems as an income generating strategy has been implemented by a multidisciplinary team of local researchers during the past seven years. In the Philippines, two researches, one by a an interdisciplinary team of Filipino researchers, and the other by a team of Filipino and Korean scientists, on coconut-based agroforestry systems deliberately designed to address the problem of rural poverty in the Mt.Makiling area were also being conducted.

This paper is primarily an attempt to discuss the socio-economic impact of these AKECOP researches in the Philippines and Indonesia with particular emphasis on how they have reduced rural poverty. Based on these experiences in the two countries, the paper also tries to draw useful insights in the planning and implementation of collaborative and other innovative research undertakings as well as development projects supportive at rural poverty alleviation.

PARALLEL SESSION C

Session parallel to Sessions list

Economic Role of Forestry in Rural Development

Friday - Sept. 7th, 8.30 - 10.30, Aula I, Building 34 (Forestry)

Moderators: Gerard Buttoud, Lech Plotkowski

*Eva **Holmgren***

Forest Commons in Boreal Sweden – influences on forest condition, management and local economy »

*Nur **Muhammed*** *Farhana **Haque*** *Masao **Koike***

Role of participatory social forestry on enhancement of socio-economic condition of the grass root level people: a case study of Dhaka Forest Division in Bangladesh »

*Anna **Barszcz*** *Alicja **Suder***

Diversity in the socio-economic role of the main non-wood forest products for the inhabitants of small villages and large towns in Poland »

*Anne **Toppinen*** *Susanna **Laaksonen-Craig***

Profit persistence in forest industry companies - comparison of Europe to North America and the emerging countries »

*Leslaw **Labudzki*** *Robert **Kamieniarz*** *Grzegorz **Gorecki*** *Jacek **Skubis*** *Anna **Wierzbicka***

Hunting in Poland in the sustained development of rural areas »

Forest Commons in Boreal Sweden – influences on forest condition, management and local economy

Eva **Holmgren**

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Keywords: Swedish forestry, forest resources management, community managed forests, Swedish forest commons

This paper examines the influences of Swedish forest commons on forest condition, management and the local economy. The approach is rationalistic, i.e. outcomes of forestry activities are assessed in relation to aims. According to the stated objectives, forest commons should serve as exemplars for improved forest management, focusing on increased and sustained timber production. They should provide sustainable economic support for farmers and the local economy, providing a sound basis for taxation and helping to secure the continued existence of the independent farming community. The aims of this paper were: (i) to compare, regionally, the state of forests under common and other types of ownership; (ii) to compare forest common shareholders with non-shareholders with respect to the harvesting intensity and related business activities on their individually managed forest properties, including consideration of taxes paid to the local municipality; and (iii) to discuss research findings regarding the extent to which the aims of the Swedish forest commons (and, in a broader context, of forest common property regimes) have been fulfilled.

In the first study, the state of the forests comprising all 33 forest commons were assessed, using National Forest Inventory data, and compared to other forests within the same municipalities. A second survey was conducted in the form of a case study with data from a single municipality relating to: forestry production parameters, sales revenues, operating costs and investments, disposable income and local municipal tax revenues. Results highlighted examples where the original aims of the forest commons have been realized to only a limited extent. For instance, the state of the forests in Norrbotten and Västerbotten revealed a comparatively restrictive harvesting policy. Results from the case study showed that shareholders' land was less intensively managed than non-shareholders' land. Both harvesting quotas and sales accounts confirmed this general finding. Shareholders also contributed less to the local economy through taxes. Since there were no indications that the potential to undertake forestry activities substantially differed between the different types of owners and property regimes, the differences in management intensity seem to be at least partially due to differences between the institutional frameworks in which they operate.

The results clearly suggest that it is important to match a property regime with the owners' aims for their properties. It is possible that the Swedish forest commons fulfil aims other than those studied, e.g. enhancing local well-being, providing ecological or amenity services, or promoting synergies between primary production and other rural activities, but these aspects require further investigation.

Role of participatory social forestry on enhancement of socio-economic condition of the grass root level people: a case study of Dhaka Forest Division in Bangladesh

Nur **Muhammed**[a], Farhana **Haque**[a*], Masao **Koike**[a]

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[*] *corresponding author*

Keywords: social forestry, Bangladesh, grass root level poor, Sal forests, financial return

Forests represent more than livelihood to many people in developing countries. Bangladesh, a densely populated country (1,127.3 person km-1), heavily depend on forests for fuel wood, timber and other subsistence. The distribution of the state forest in Bangladesh is very much eccentric that 28 districts of the total 64 have no designated forests. Although Bangladesh Forest Department being the state agency adopted scientific forestry management over a century ago, it has not been able to stop rampant deforestation. The deforestation rate in Bangladesh was 0.9% in 1970, but rose to 2.7% in 1984 - 1990. Huge population, limited land, and overwhelming poverty compelled policy makers to think about alternatives to traditional forest management. Participatory social forestry as an alternative approach was introduced in Bangladesh in early 1980s and has proved to be quite effective. This study has been conducted on participatory social forestry in degraded Sal (Shorea robusta) forests under Dhaka Forest Division in Bangladesh. Due to its location in the central part, this forest is subjected to tremendous illicit cutting and land encroachment. According to the official record, about 3,995 ha of forest land of this Division is encroached upon and has been put to other uses. In order to improve the forest condition a total of 2,337 ha of woodlot plantation and 1,599 ha of agroforestry plantation have been raised under social forestry system involving 3,305 grass root level poor as active partner. A number of such beneficiaries have got their share of benefit after harvesting the plantation.

Few studies are available on social forestry in Bangladesh. This research focused on an analysis of the role of participatory social forestry on enhancement of socio-economic condition of the grass root level poor. It is found that three types of plantation (viz. woodlot, agroforestry and strip plantation) raised under social forestry were financially profitable. Average per unit area Net Present Value (NPV) was the highest in the strip plantation (US$ 7,857) followed by the woodlot plantation (US $ 4,350) and lowest in agroforestry plantation (US$ 4,222). Average Benefit Cost Ratio (BCR) was the highest in the strip plantation (2.78) and lowest in the woodlot plantation (2.36). On an average, each participant received US$ 1,786, US$ 3,092 and US$ 3,338 from the strip plantation, agroforestry and woodlot plantation respectively. Additional forest based income has a significant contribution to improve socio - economic conditions of the poor. It is found that individuals recognized as encroachers in the past have now become vital stakeholders of forests as well as recognized member in community. Along with the success story negative findings of the programs are that after 25 years of social forestry practice in Bangladesh, poor people as program beneficiary still remain skeptical towards the program due to various administrative dilemmas, lack of policy instrument like usufruct right. These need to be resolved for the sustainability of the program. Finally, if the failures of traditional forest forestry are considered, then participatory social forestry would be a far better option.

Diversity in the socio-economic role of the main non-wood forest products for the inhabitants of small villages and large towns in Poland

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Keywords: non-wood forest product, household income, living standard, village, town

This paper presents research results conducted in 2004 and based on 442 questionnaires spread all over Poland. The set of data was composed and sorted by the size of residential village or town. Obtained results show that most residents of small villages live near forests (up to 5 km), more people work in professions associated with forestry or agriculture, and higher percentage of them sell non-wood forest products.

The main aim of visiting forests by the city-dweller (above 10.000 cititzens) is recreation in connection with gathering non-wood forest products used for their own needs. The most frequently harvested products are mushrooms and fruits. The level of harvesting is constant during the last years according to most respondents in the research. Only a small percentage of households notes its growing caused mainly due to the deteriorating economic situation of households and expected good profit. Decreased level of harvesting is connected with smaller fructification.

Non-wood forest products provide a way to increase household income in small villages more than in large towns, but in the majority of cases, doesn't improve families economic situation. The income from selling non-wood forest products is used mainly to buy food and clothes. Most respondents are not willing to establish their own processing plant for forest fruit or mushrooms, usually due to the lack of financial profitability and financial resources, and this proportion is higher in towns. Because of the small income from the other sources and expectation of a high profit from marketing the non-wood forest products, mainly residents of small villages are decided to set up their own purchasing centre for NWFP.

Profit persistence in forest industry companies - comparison of Europe to North America and the emerging countries

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Keywords: globalisation, profits, scale economies, panel unit root tests, forest industry

Development of globalizing forest industry is strongly shaping local livelihoods of rural communities in forestry dependent areas of Europe. In the forest industry, a quest for improving competitiveness and efficient procurement of high quality wood raw material has motivated companies towards internationalization. However, the impact of internationalization on sustainable economic performance has not been analysed.

This study compares persistence of company profits (ROCE) and tests for positive scale economies of globalizing forest industry companies in Europe, the US, Canada, and in the group of emerging countries. In the empirical analysis we use time series-cross section accounting data set from 49 companies between years 1996-2005. According to our results, the increase in the size of companies and the improvement in profitability are not statistically related, and there are clear geographic and cyclical differences between firms. Thus, there are no apparent signs of scale economies in the industry. Panel unit root tests indicate that on the global scale there are no persistent firm specific profits above the norm among the largest forest industry companies, but that the location of company headquarters impacts on the profit persistence as there was some evidence for the profit persistence in the group of Canadian firms.

As investors and stock markets value short-term economic performance, offshoring and streamlining of operations will likely continue in the future, which will inevitably have an adverse impact on industrial job opportunities in some developed regions of Europe. Therefore, future studies should be targeted towards better understanding of the interplay between economic sustainability, as indicated by firm profitability, and the role of social and environmental sustainability issues within the largest companies.

Hunting in Poland in the sustained development of rural areas

Leslaw **Labudzki**[a], Robert **Kamieniarz**[a], Grzegorz **Gorecki**[a], Jacek **Skubis**[a], Anna **Wierzbicka**[a*]

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Keywords: game management, rural areas, perspectives, problems.

According to basic hunting principles in Poland, free game is owned by the State Treasury, while the hunting economy can be performed in districts of more than 3,000 hectares of land, leased for 10 years generally by groups of hunters who are members of the Polish Hunting Association.

The State ownership of most Polish forest areas and of the free game, the large required area of a hunting district as well as a small number of hunters (4 hunters per 1,000 hectares of hunting areas) result in the limited impact of human presence on game populations. Therefore, hunts in Poland provide hunters with an opportunity to encounter many animal species, including mature specimens in their almost natural environment. This situation, coupled with Poland's accession to the EU and the resulting ease of movement, contributes to a hunting tourism development. As a consequence, there has been a rise in the demand for services offered by rural areas inhabitants, including farm lodgings, local cuisine, handicrafts as well as agricultural and transport services for hunting grounds and during hunts.

The obligatory membership of Polish hunters in one of hunters' association helps introduce large-scale programmes for the improvement of hunting grounds' environment. At present these programmes concern particularly the rural areas which have been undergoing dynamic changes following the introduction of the EU Common Agricultural Policy. An example of such an initiative is the "Developing fields" programme ("Ożywić pola") which aims at the preservation and development of tree-covered areas in between the fields, while involving the hunters in promoting the EU agri-environment schemes.

PARALLEL SESSION D

Session parallel to Sessions list

Forests and Rural Development: Experiences from Developing Countries

Friday - Sept. 7th, 8.30 - 10.30, Aula II, Building 34 (Forestry)

Moderators: Michael Kleine, Maciej Skorupski

Jens Friis ***Lund***

Democracy in the making: critical perspectives on recent studies on democratisation and local forest management in Tanzania »

Georg ***Gratzer*** *Tashi* ***Dorji*** *Darabant* ***Andras*** *Lungten* ***Norbu***

Research for people - the conifer research and training partnership in Bhutan »

Morten ***Christensen*** *Santosh* ***Rayamajhi***

Balancing firewood and biodiversity concerns in rural Nepal »

Irmeli ***Mustalahti*** *Iben* ***Nathan***

Constructing and sustaining participatory forest management: lessons from Mozambique, Tanzania, Laos and Vietnam »

Democracy in the making: critical perspectives on recent studies on democratisation and local forest management in Tanzania

Jens Friis **Lund**

University of Copenhagen, Faculty of Life Science, Danish Centre for Forest, Landscape and Planning, Denmark

Keywords:

Many developing countries are currently in the process of developing and implementing decentralised natural resources management, and the area has attracted much scholarly attention. This paper is a contribution to the debate on the potentials and pitfalls of decentralising natural resources management, focusing on the case of decentralised forest resources management in Tanzania. The paper draws on research on the development of the Tanzanian local government system as well as a number of recent studies on the functions of the current local government system and on the experiences with decentralised forest management. In the recent studies, two schools can be identified: one which focuses on evidence of poor governance at the Tanzanian local government level and which is pessimistic about its potential, and one which focuses on the democratic structure of the current local government system and which praises its strong potential. Based on the outline of the development and current structure of the local government system, this paper argues that the current observable problems reflect the brief history of real democratic local and central government structures in Tanzania, and that recent studies providing evidence of good governance at the local level indicates a potentially promising future for the local government system including decentralised forest management in Tanzania. The paper, however, also acknowledges the existence of and outlines some critical assumptions that must be fulfilled for this promise to be fulfilled.

Research for people - the conifer research and training partnership in Bhutan

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Keywords: research partnership, Bhutan, human capacity building

Research in developing countries undergoes a paradigm shift from being dominated by academic or economic needs of the North towards a research which responds to the needs of the developing countries, creates and enhances ownership of knowledge in the South and thereby achieves sustainability in terms of problem solving capacity. These goals require a strong human capacity building component as an integral part of the partnership. Research partnerships which are primarily driven by a Southern agenda and where the researchers of the North are collaborators providing input as equal partners are generally accepted as research structures which fulfill the above mentioned principles.

The Conifer Research and Training Partnership (CORET) is a research partnership between the Institute for Forest Ecology, University of Natural Resources and Applied Life Sciences, Vienna, Austria, and the Renewable Natural Research Centre Jakar in Bhutan. The research agenda for the partnership is formulated in a participatory process based on involvement of the stakeholders, and active involvement of the stakeholders should ensure that socially significant questions are addressed in terms of a need-based and demand-driven research and should guarantee a balanced representation of stakeholders. This balance is not always easily attained and requires special attention. By advocating a cyclic knowledge generation process, CORET aims at bridging gaps in research implementation and tries to overcome the problems created by a linear knowledge generation process. This conventional research approach which is frequently seen as an “old paradigm” science proceeds linearly from a generated hypothesis to a conclusion and to publication by means of field work and analysis. The initial questions of “who generated the hypothesis and are they relevant” and the final questions of “how are the results used” and “does it work in practice” are not asked in this approach.

The collaborative project planning and, more importantly, a collaborative implementation ensure mutual trust and successful cooperation which in turn strengthen ownership, the key to achieve sustainability and relevance. The latter goal requires a strong human capacity building component as an integral part of research. In order to achieve this, CORET relies on multiple strategies for human resource development: (1) in-country training courses, (2) on-the-job training, (3) twinning arrangements with foreign partners, (4) out of country trainings, and (5) M.Sc. Curriculum in Mountain Forestry at BOKU and doctoral studies at BOKU. Currently, studies on the ecology and economics of lemon grass in Pinus roxburghii forests and on the regeneration ecology of conifer forests of the country are carried out. The former research tasks aims at improving the harvesting methods of lemon grass which is the most important income generation in Eastern Bhutan. By addressing sustainability of this NTFP use, the rural- urban migration should be slowed down. The latter research topic addresses problems of sustainability of logging operations, thereby including and integrating local forest uses like cattle grazing in the forests. It thus aims at improving the livelihood and reducing poverty.

Balancing firewood and biodiversity concerns in rural Nepal

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Keywords: biodiversity, dead wood, firewood, rural development, polypores

The balance between protection of biodiversity and local use of natural resources is a challenge for most developing countries. In rural areas of Nepal dead wood from natural forests is the most important source of firewood. The annual amounts harvested from a given forest in the country range from 400 to more than 1500 kg per capita, depending on the wood resources in the surroundings, the amount of trees on private land, and the climatic conditions. At the same time, dead wood is known as one of the most important habitats for biodiversity in forests, supporting a wide variety of organisms.

The present study took place in an 1178 hectare forest area in rural mountainous Nepal. The methods included mapping the amounts of dead and living wood in 122 permanent sample plots, a household survey of consumption and preferences of firewood, and studies on the diversity of wood inhabiting polypore fungi.

The area of the study housed remote areas of virgin forest and a gradient in the amount of dead wood from 0 to more than 400m3 per hectare. The average dead wood suitable for firewood was 28 m3 per hectare equal to approximately 20,000 kg per hectare. A geographical analysis shows a clear relation between the amounts of dead wood and the distances to the villages, with high volumes only in remote places. Collection in remote areas requires high amounts of labour and leads to higher prices for the firewood. We calculated the efficiency and costs of firewood collection and compared results with information on alternative fuel types such as butane gas and kerosene

The study area is part of a nature conservation area and protection of biodiversity is an important objective for the management of the forest resources. To relate the distribution of dead wood and exploration of firewood to biodiversity we studied the diversity of wood inhabiting polypores. The number of polypore species per research plot responds positively to an increasing amount of dead wood and some polypore species seem to be restricted to places with continuous supply of dead wood.

Interviews with local users and a house hold survey found an average yearly consumption of firewood of 1478 kg per capita in the study area. The local preference list for firewood species was developed and the balance between quality and availability discussed. For the biodiversity of wood inhabiting species specialised in a single tree species, typically the case for many polypores, a selective collection of firewood could potentially threaten the biodiversity of the area.

The study area at present has a rather large resource of dead wood and potential firewood but the information from our study clearly points out some dilemmas in relation to biodiversity conservation in rural areas with a high dependency on forest resources.

Constructing and sustaining participatory forest management: lessons from Mozambique, Tanzania, Laos and Vietnam

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Keywords: participation, forest management, decentralisation, sustainability, donor funding

This paper aims to contribute to the discussion on factors that are decisive for ensuring sustainable participatory forest management (PFM). The paper presents a model, the 'house model', containing key elements for constructing and sustaining participation in forest management. This model is used as a tool for analysing PFM cases from Mozambique, Tanzania, Laos and Vietnam. In theory, the elements of PFM in the model are basic requirements for ensuring that the participation of local people in forest management will continue after external donor funding ceases.

The conclusion is that decentralisation of decision-making powers is important to the success of PFM, but this factor loses importance if participating communities: (a) do not have a positive attitude towards forest protection, (b) access to long-term information flow through forest extension services, and (c) obtain direct monetary benefits or indirect and direct non-monetary benefits through forest in their particular environment.

PARALLEL SESSION E

Session parallel to Sessions list

Policies Supporting Rural Development

Friday - Sept. 7th, 10.45 - 12.45, Aula I, Building 34 (Forestry)

Moderator: Krzysztof Janeczko

Michael ***Kleine***

Training on science-policy interface: experiences from Asia and Latin America »

Anssi ***Niskanen***

Futures research to support policy - decisions for the forest sector viability »

Lukas ***Giessen***

Regional governance for improving rural development policies and the question of how forestry acts within integrated programmes? »

Gerardo ***Mery*** *Ilpo* ***Tikkanen*** *Anne* ***Toppinen*** *Heidi* ***Vanhanen***

A policy brief: making European forests work for people and nature »

Training on science-policy interface: experiences from Asia and Latin America

Michael **Kleine**
IUFRO Headquarters, Austria

Keywords: science-policy interface, training, developing countries, forest policy

The need for sound scientific information in the development of public forest policies at the local, national and international levels has grown significantly in recent years. So too has the need for such information within the private forestry sector and among non-governmental organizations, whose role in the development, sustainable management and conservation of forest resources in all regions of the world is steadily increasing in importance. In order to generate value for society, research results should be used by someone – policy-makers, forestry practitioners, landowners, investors, educators and other researchers. The science-policy interface is all about utilising scientific knowledge more effectively.

With this end in mind, the International Union of Forest Research Organizations (IUFRO) through a special Task Force has compiled best practices for scientists on how to effectively work at the science-policy interface. Based on these guidelines, IUFRO's Special Programme for Developing Countries (IUFRO-SPDC) has developed a training module on the subject and offers training courses for scientists and practitioners from economically disadvantaged countries in Africa, Asia and Latin America.

Thus far, four such courses have been implemented in Asia and Latin America. Each course takes three to four days and includes presentations on local, regional and global forest-related policy issues, best practices guide for work at the science-policy interface as well as case studies demonstrating how science-policy interactions have been incorporated into research and development projects. Considerable time during the workshop is also dedicated to group work whereby participants discuss and analyse how far the best practices on science-policy interactions have been incorporated in the projects. These exercises are excellent ways of reaching an in-depth understanding of the nature of policy processes and the opportunities and limitations for the science community to contribute to policy processes and decision-making. The paper describes the content of the science-policy training courses and presents some of the major results obtained in several workshops in Asia and Latin America.

Futures research to support policy - decisions for the forest sector viability

Anssi **Niskanen**

University of Joensuu, Future Forum on Forests of Finland , Finland

Keywords: Futures research, science-policy interface, forest policy, livelihood, decision making

The Finnish Ministry of Agriculture and Forestry established a futures think tank called the Future Forum on Forests of Finland in 2003 to foresee long-term changes affecting forest-based livelihoods for the forthcoming decades. The aim of the Forum is to support decision making in forest-related policies, forest sector organisations, enterprises and institutions.

The establishment of the Future Forum on Forests has been an important milestone in increasing the use of foresight in forest-related policy planning in Finland and it has strengthened science-policy cooperation. The science-policy cooperation is based on the wide participation of more than 160 experts from administration, research, industries, corporations and business services. Intensive consultation of different stakeholders has improved the relevancy of the conducted futures analyses in decision-making.

The Forum has conducted fifteen futures studies, organised seven seminars and published ten reports with their focus on the forest sector's future.

The first part of the work in 2003–2005 included a futures analysis of important and internal parts of the forest sector (forest industry, forest technology, silviculture, environment, social sustainability and nature-based tourism). The second part of the work in 2005–2008 has focused more on the future trends external to but fundamentally important for the forest sector and its future. The multidisciplinary futures studies include the analyses of future development of globalisation, primary success factors of the Finnish forest sector in the future, and the future business opportunities in different forest-based value chains. The methods applied are scenario techniques, delphi-analysis, the analysis of weak signals, trend extrapolation, expert opinions and systems analysis.

One particular study of the Forum focused on the new business opportunities evolving in the forest-based value chains. The study was found most essential due to the competitiveness of traditional forest sector production in Finland being under a threat of decline.

According to this study, novel forest-based business opportunities in Finland exist particularly in wood construction, packaging, tourism, heat production and biofuels. As an example, some of the major forest industry enterprises have already announced large-scale biofuel production starting in five to ten years' time.

The key to the new forest-based business opportunities is to generate concrete ideas on how to satisfy different customer based value chains with wood products or forest services. This requires new thinking and evolutionary business concepts that can be found in the interface of the forest and other business sectors.

The Forestry Council of Finland has used futures studies in outlining a strategic background document for updating the current National Forest Programme until 2015. The aim of the document is to make forest-related policies more proactive and future oriented.

Interest in the futures analyses has grown rapidly in forest policies and forest organisations in Finland. With futures analyses the forest sector is preparing for structural changes facing the sector in the future.

The paper proposed will introduce the work and main results of the Future Forum on Forests of Finland since 2003. Focus will be on the introduction of futures research as a new science based approach supporting decision making in forest-related policies and forest sector institutions.

Regional governance for improving rural development policies and the question of how forestry acts within integrated programmes?

Lukas **Giessen**

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Keywords: integrated rural development policies, regional governance, role of forestry

Rural development policies show a trend from sector-oriented towards more integrated approaches (Lanschow 2002, OECD 2006). In addition, we also observe rural development gaining momentum as a political issue, as e.g. reflected by the EU's new rural development regulation (EAFRD) as well as by an OECD book publication on 'The new rural paradigm' (ibid.). The approach taken by such integrated policies to a large extend builds upon the concept of Regional Governance as a frame for facilitating negotiated spatial planning among a variety of public, private and civil society actors, thus addressing the complex issue of rural development as a whole. Based on empirical findings from three case studies this paper illustrates how such an approach improves the ability of policy to dealing with the highly complex issue of rural development.

The question of the actual significance of the above trends for forests and forestry partly remains to be answered. While the contribution of the sector to rural development has been subject to research and policy debates (and also will be addressed by the conference), the role of forestry within integrated programmes largely remains undefined. Furthermore, the significance and potential benefits of integrated rural policies for the sector also are unclear. This paper will make an attempt to empirically contribute to answering the latter two aspects of the overall question on the role of forestry in rural development and respective policies.

A policy brief: making European forests work for people and nature

Gerardo Mery[a], Ilpo Tikkanen[b], Anne Toppinen[b*], Heidi Vanhanen[c]

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Keywords: sustainable development, sustainability, Europe, policy research

Among other activities in the 2nd phase of the project 2007-2010, IUFRO's Special Project on World Forests, Society and Environment (WFSE) will produce Policy Briefs on regionally critical issues of global importance in the forests-society-environment interface. Policy Briefs are intended to bridge the gap between policy-makers and scientists in the formulation and application of policies in forestry and forest-related issues in other sectors, thereby supporting sustainable development and wellbeing of people.

The Policy Brief "Making Latin-American Forests Work for People and Nature" will be finalized in September 2007.

The strategy of European Forest Institute (EFI) includes developing tools and mechanisms to strengthen science-policy interface at Pan-European level, with national implications. The Policy Brief on Europe is a joint effort of EFI and WFSE, with strong support of other European members of WFSE: Federal Research Centre for Forestry and Forest Products (BFH) and Finnish Forest Research Institute (Metla). Even other European experts will participate at various stages in the process.

Critical in the welfare of people and nature are three interlinked issues: economic vitality and competitiveness of European forestry sector, ecological sustainability for supplying environmental and amenity services, and socio-cultural sustainability. The dynamic connections between these critical issues are shaped by e.g. globalization, changing distribution of forest resources and shifting demand for forest products, climate change and increased demand for diverse environmental services, demographic changes in Europe, as well as changes in values and attitudes. The initial situation and the rates of change vary in different parts of Europe. The challenge is how to improve governance of natural resources and provide mechanisms and new institutional solutions to address the critical issues in securing the economic, social and environmental welfare benefits of forests.

The main contents of the Policy Brief will be presented for discussion. The finalized Policy Brief will be launched in the MCPFE Warsaw Summit in November 5-7, 2007.

PARALLEL SESSION F

Session parallel to Sessions list

Forests and Forestry - Public Perception

Friday - Sept. 7th, 10.45 - 12.45, Aula II, Building 34 (Forestry)

Moderators: Margarida Tome, Bogdan Brzeziecki

*Pat **Farrington***

Landscape planning for Irish Forestry: An analysis of public perceptions of forest landscapes »

*Wieslawa L. **Nowacka***

Women forest dwellers daily use of forests in Poland »

*Santosh **Rayamajhi*** *Berit C. **Kaae***

Tourism impacts on the forests and livelihoods of a mountain community in Nepal »

*Mehmet **Gokmen*** *Taner **Okan***

An example for common efforts in forestry villages of west Black Sea region - Turkey »

*David **Edwards***

Capturing the social and cultural values of European forests: insights from 'F4P' and 'EFORWOOD' »

Landscape planning for Irish Forestry: An analysis of public perceptions of forest landscapes

Pat **Farrington**

Forest Service, Department of Agriculture and Food , Republic of Ireland

Keywords: forest landscape planning, landscape preference, public participatory approach, Average Visual Quality (AVQ) index, photographic surrogate

This paper examines issues involving landscape aestethics, landscape planning and management. The definition of landscape being 'an area, as perceived by people, whose character is the result of the action and interaction of natural and /or human factors.' This research is concerned with the collection of data, which is open to interpretation, for instance attitudes, and opinions, which can be validated statistically.

The approach seeks to establish quantative relationships between physical features of environmental stimuli and human perceptual responses, where the public not experts determine landscape quality. In this study, a random sample of the Irish public was undertaken in order to ascertain their preference for different landscapes types by utilising 36 digital photographic images chosen to represent different landscape character types including depictions of landscapes from countries as far apart as Denmark, Sweden, Italy and Ireland.

The use of landscape preference information when combined with a land use classification data stored in GIS format can enable planners to determine the perceived significance of development in particular areas.

The results suggest that a photo questionnaire is a readily understandable method for discovering people's preference for environmental elements. Statistical analysis was undertaken using Excel software packages. The individual scores for each landscape type (as represented by the photographic surrogate) were added and an average score was calculated for each photo. This score represents the Average Visual Quality (AVQ) index for the photos used. Though limited in extent, the survey of the Irish publics perception of different landscape types confirms some common trends with previous research conducted outside Ireland. Predictably, landscapes where water, forest and mountain were present received high satisfaction ratings. Surprisingly some ordinary landscapes included in the survey were rated higher than areas categorised as outstanding natural landscapes. This may indicate that previous attempts to classify areas of outstanding natural beauty in Ireland are not comprehensive enough to record all landscapes that are highly valued by the general public.

The type of information required for informed landscape management is presented in map and digital GIS format by means of a simulated fly-thru in the Wicklow Uplands a case study area. The importance of a public participatory approach to landscape assessment and evaluation in a professional planning context is widely acknowledged but rarely implemented. Public preference was also compared with "expert" preference in the study. This survey of public preference not only satisfies 'agenda 21' approaches to public participation in landscape planning and design, but provides information about preferences and potential constraints and also assures that the public opinion is incorporated into the planning process.

Women forest dwellers daily use of forests in Poland

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Keywords: forest dwellers, non timber use of forests, forestry

Contemporary societies emphasize much more the increasing use of the forest for purposes other than wood production. The importance of forests grows as the financial situation of families decline. Forests are playing an important role especially for inhabitants of small towns and rural communities.

The goal of the research was characterization of the actual means and directions of the use of forest resources by small communities, with emphasis on the importance of women. The intent was to determine to what extent forest were essential to the functioning and development of families in small settlements, villages and towns. The objective of the research was to determine most important ways of use of forests in rural areas and their role in social development of families.

This paper discusses achievements of survey done in Poland. Data were collected through quantitative questionnaires (with 48 questions) including: financial status of families, their needs, ways of using forest resources, influence of forests on earnings, women health and mental state, house work and duties, women expectations and hopes. The questionnaires were responded by women from small hamlets, villages and town located inside large forest expanses, or near their edges. The questionnaires were distributed to the women directly by the person gathering data, rather than via mail or other means.

A total of more than 1000 female inhabitants responses are statistically worked out and presented in this paper.

Tourism impacts on the forests and livelihoods of a mountain community in Nepal

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Keywords: tourism impacts, natural resources, income analysis, livelihood, poverty alleviation, mountain community, Nepal

Tourism in rural mountain communities of developing countries offers great potential for rural development and livelihood support. It is well understood that mountain tourism has clear impact on employment and income, but limited knowledge is established on the magnitude of this impact on poverty alleviation and forest conservation. The tourism in rural mountain communities of developing countries is often linked to unbalanced use of the natural resources and uneven distribution of the benefits (income) from tourism. Environmentally, this causes forest degradation and deforestation due to the tourism-induced demand for firewood, charcoal and timber. Economically this includes high leakage and poor trickle down effects of benefits within the communities. High environmental quality and hospitable local communities are key factors in the tourism experience. If these qualities are degraded, tourists may choose other regions and tourism growth will suffer and ultimately cease. In Nepal, the relationship between forest conservation and utilization involves analysis of mountain tourism issues. Maximizing tourism's benefit on local economy and natural resources is a prime concern, given that tourism has possibly the greatest potential for expansion in Nepal as a way of reducing poverty. The study is thus aimed at assessing the impacts of tourism on the forests and the livelihoods of local people in two mountain villages in Nepal – one with and one without tourism.

This PhD research was conducted in a climatically cold and forest resource rich high altitude area (settlement 2000-2900 masl) of the lower Mustang District in upland Nepal between November 2005 – October 2006. The methodology involved socio-economic surveys of villages, households, and the tourism entrepreneurs by using RRA/PRA and questionnaires on tourism demand, supply, and leakage as well as the use of timber and various fuel energy resources. A total of 192 randomly selected households including 32 tourism entrepreneurs distributed in 2 forest dependent villages with and without tourism were surveyed. The surveys were replicated among the same respondents over four quarters of the survey year. This study analyzes the economic value of forest resources in household income and the pattern of timber use and the fuel and energy resource consumption.

The paper presents the survey results focusing on how tourism-derived household income depends on the forests and forest products. Results suggest that the tourism-dependent households have higher forest derived income but also a higher awareness of forest conservation and an increased use of fuel conservation technologies, forest planting schemes, and other initiatives to mitigate the negative environmental impact from tourism.

An example for common efforts in forestry villages of west Black Sea region - Turkey

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Keywords: sustainable development projects, participatory, leadership, village women, fair trade

Kure Mountains National Park is one of the most precious natural old forests in Turkey. Situated at the north-west of Turkey, the region is very rich with water resources, caves, and canyons are habitats for 675 plant species, 40 mammals, 147 bird species.

In 1998, WWF started a campaign called “100 hot points in Europe”. One of the forests given in their list to be protected was Kure mountains. The campaign helped the related authorities in Turkey to understand the need to protect the area and to support the region for sustainable development projects.

In 2000, with the advocacy efforts of NGOs in Turkey, the area was given “natural park” status. A “Participatory Management Plan for the National Park” was prepared by Ministry of Forest, by local authorities and by NGOs working together in cooperation.

Between 2000-2005, in line with the plans, it was decided to support the small local groups in their efforts for sustainable development. UNDP supported the local NGOs with small grants program for their sustainable income generating projects . Some examples between 2000-2005 are:

- Changing a village habitants’ main income activity from wooden carving to pension management for eco-tourism.

- Restarting the local traditional linen planting and production.

- Restorating the old houses for eco-tourism services.

- Trainings for young people to serve tourists as “nature guide”.

- Meetings between villages to create sustainable income activity ideas...

- Collecting forest products like pine cones for exporting as a christmas ornaments.

One of the villages in the buffer zone got all the attention of the local authorities, planners and NGO groups with their activities. The villagers already established a small society in their village to develop sustainable development projects in 1998. The group participated to the regional meetings and shared the outcomes of the meetings with 19 other villages around them. They listed the possible sustainable economic activities, needed trainings for themselves and the type of supports they need.

This initial effort by villagers was appreciated by the authorities and they were oriented to UNDP in 2002. The prepared project consisted of hiring 2 experts, one botanist and one culture-nature relation expert from min. of culture. Both experts studied the daily practices in the region and the possible opportunities to collect and sell the forest products in a sustainable way. The outcomes were shared with all villages around, in the leadership of the small society:

- It is village women who are intensely use forestry products and horticulture and selling natural products in the open markets of towns.

- They are sensitive to protect the nature.

- They need to gain income, and their activities are not enough for their family to continue living in their homeland. Instead they had to send their young children, their husbands to the big cities to work in seasonal works.

- Therefore they want to learn more and become able to market their products to the big cities to gain more.

IMECE, is a group of young marketing people who makes “fair trade” in Istanbul. The group

was invited to the region and met the women in the villages to sell their products in Istanbul.

At the moment, the village women want to establish their manufactory for producing ecological jam, pickles, souces in their villages and to get organic products certificate. IMECE is helping them to reach their common target.

Capturing the social and cultural values of European forests: insights from 'F4P' and 'EFORWOOD'

David **Edwards**

Northern Research Station, Forest Research, Social and Economic Research Group, Scotland

Keywords: social and cultural values, externalities, indicators, sustainability assessment

The social and cultural values and meanings people attach to the natural environment are increasingly recognised throughout the forestry sector, but several political and conceptual barriers still need to be addressed before they can be fully incorporated into policy-making, and translated effectively into actions on the ground. Part of the problem lies in the intangible and inter-linked character of many social and cultural values, which makes it difficult to justify investments that aim to enhance them, since their public benefits are hard to describe, measure and evaluate. Yet the benefits people derive, for example, through identification with particular forests, or by seeing forests as symbols of wilderness, historical continuity, or spiritual dimensions in their lives, are undeniably important, and often rank higher in public consultations than the tangible 'traditional' economic benefits such as timber production.

The dominant kind of evidence favoured by decision-makers is expert-driven, quantitative, and if at all possible, expressed in terms of money values. The discourse of sustainability, and the 'triple bottom line' approach to sustainability impact assessment now obliges European policy-makers to capture the social consequences of policies and programmes. In practice the rich diversity of values that the public associates with forests are reduced to narrow measures such as levels of employment and salaries of forest sector workers.

Much progress has been made by environmental economists to derive economic values for non-market social and cultural externalities such as the value of forest recreation, and the contribution of forests and trees to landscape attractiveness, economic regeneration and rural tourism. But their methods remain controversial and values calculated for particular locations and contexts may not apply elsewhere with sufficient credibility. In contrast, descriptive evidence, such as quotes taken from interviews and focus groups with forest-based communities or recreational users, is increasingly used to great effect. Although qualitative evidence is criticised by scientists for being subjective and anecdotal, its legitimacy and impact is enhanced by claims that it can represent the 'genuine' voices and values of particular groups in society. When linked to participatory processes that seek to engage stakeholders in forestry decision-making, descriptive evidence can offer a powerful alternative to a strict adherence to reductionist neo-classical economics.

This paper draws from experiences with two research projects which in different ways have sought to capture the social and cultural values associated with forests: a) F4P: A Valuation of the Social and Economic Benefits of Forestry for People in Scotland, and b) EFORWOOD-IP: Tools for Sustainability Impact Assessment of the European Forestry-Wood Chain. The paper discusses the extent to which each project has succeeded in developing and using frameworks of quantitative and qualitative social and cultural values and indicators, and how these are being used to influence policymakers, in Scotland and across Europe.

PLENARY SESSION II

Sessions list

Future Research Agenda (discussion panel)

Friday - Sept. 7th, 15.00 - 17.00, Crystal Aula (Old Campus)

Moderator: Peter Mayer

INVITED PANELISTS:

Ann Bartuska	Dr, US Forest Service R&D Deputy Chief
Niels Elers Koch	Prof., IUFRO Vice-President for Science
Risto Paivinen	Dr, EFI Director
Risto Seppala	Prof., IUFRO Past President
Piotr Paschalis-Jakubowicz	Prof., IUFRO Board Member
Konstantin von Teuffel	Prof., IUFRO Coordinator "Management of Forest Research"

POSTER SESSION

Sessions list

Forests and Forestry in the Context of Rural Development

Thursday - Sept. 6th, 17.30 - 18.30, Crystal Aula Hall (Old Campus)

Moderator: Katarzyna Marciszewska

Andrzej ***Bytnerowicz***
Air pollution from agricultural/urban areas as a major anthropogenic factor affecting Sierra Nevada forests »

Arsenio B. ***Ella*** *Emma P.* ***Abasolo***
Assessment of the resin tapping practices in selected forest mountain areas of Samar, Philippines and their influence on the conservation of Almaciga (Agathis philippinensis Warb) »

Yasin ***Ucarli***
Contributions of Wildlife to Rural Development in Turkey »

Wieslawa L. ***Nowacka***
Ergonomic aspects of managing forests for recreational needs. Anthropometric data – do we need them? »

H. ***Ferrufino Ugarte*** *Tomasz* ***Zawila-Niedzwiecki*** *J. R.* ***Santos*** *F. D.* ***Maldonado***
Forest change detection based on satellite image radiometric processing »

Agata ***Wencel*** *Pawel* ***Strzelinski*** *Malgorzata* ***Dudzinska*** *Stefan* ***Panka*** *Tomasz* ***Zawila-Niedzwiecki***
Forest inventory survey – today and in future »

Thomas ***Brogt*** *Barrie* ***Hudson*** *Edgar* ***Kastenholz*** *Wieslawa L.* ***Nowacka***
Forestry Contractors Research Needs - Contractor survey results lead to research demands for improving health and performance in forest operations »

Joanna ***Adamczyk*** *Wiktor* ***Tracz***
Geomatic technologies research and education at the Faculty of Forestry at Warsaw Agricultural University »

Fabrizio ***D'Aprile***
Impacts on forest resources caused by the 'High Speed' train line in Tuscany (Italy) »

Morteza ***Pourreza***
Investigation of the economical role of Wild pistachio (Pistacia atlantica) forest in rural people life in Iran »

Eyad Hamad ***Abushandi*** *Alfred* ***Schultz*** *Tomasz* ***Zawila-Niedzwiecki***
Land cover change estimation using GIS: studying climate variables effect »

Manuela A. ***Abellan*** *Manuel E.* ***Lucas Borja*** *Antonio* ***del Cerro-Barja*** *Francisco A. G.* ***Morote*** *Francisco R. L.* ***Serrano***
Landscape quality in the area of the river Mundo (Castilla - la Mancha, Spain) and rural development »

Air pollution from agricultural/urban areas as a major anthropogenic factor affecting Sierra Nevada forests

Andrzej **Bytnerowicz**

USDA Forest Service, Pacific Southwest Research Station, USA

Keywords:

California Central Valley and San Francisco Bay are major sources of urban and agricultural air pollution emissions. From the biological perspective, ozone and nitrogenous pollutants (such as nitrogen oxides, nitric acid or ammonia) have the most pronounced effects on the adjacent Sierra Nevada forest ecosystems.

High concentrations of ambient ozone cause damage of sensitive tree species, such as Jeffrey pine (Pinus jeffreyi) or ponderosa pine (P. ponderosa). Elevated levels of nitrogen deposition resulting from high ambient concentrations of nitric acid and ammonia, lead to changes in physiology and growth of trees and cause changes in species diversity, especially lichen communities. Increased N deposition to the Sierra Nevada terrestrial ecosystems leads to serious contamination of lakes and streams with toxic nitrate.

In addition, high concentrations of various air pollutants, especially ozone, create a health risk to the Sierra Nevada residents and numerous visitors to its national forest and parks, including Sequoia and Kings Canyon National Park, Yosemite National Park or the Lake Tahoe Basin. Scientists of the USDA Forest Service Pacific Southwest Research Station in collaboration with their partners at the USDA Forest Service National Forests System, National Parks Service and various universities, study various aspects of environmental risks in the Sierra Nevada related to air pollution, changing climate, urban and agricultural development, land & air resources management, tourism, and other anthropogenic activities.

Assessment of the resin tapping practices in selected forest mountain areas of Samar, Philippines and their influence on the conservation of Almaciga (Agathis philippinensis Warb)

Arsenio B. **Ella**[a*], Emma P. **Abasolo**[b]

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Keywords: Almaciga resin, Manila Copal, resin tapping, Samar

Almaciga trees grow on well-drained slopes at altitudes of 200-2,000 m and occur naturally on almost all of the country's mountain ranges. Because the Philippine government prohibits felling of the tree, the almaciga's use is limited to its resin, known in world trade as Manila copal. This resin is used as an ingredient in the manufacturing of paints, varnishes, lacquer, soap, printing inks, shoe polish, floor wax, plastic water-proofing materials, etc.

This study was conducted to evaluate the sustainability of tapping practices for Almaciga resin production in Samar and their impacts on the conservation of almaciga. Four levels of analysis were done: first level analyzes the relationship of the socio-economic factors with the resin tapping practices, second level focuses on various resin tapping practices in the study area in relation to a predetermined set of evaluation criteria, third level concentrates on the relationship of the practices with the resin yield, and the fourth level looks at the relationship of the practices with the total number of tree deaths. Trend analyses were done in the first, third, and fourth levels of analysis. Regression and correlation analyses were likewise conducted to support the results.

The second level, which is the emphasis of this study, has been placed on analyzing whether or not the current practices significantly deviated from the ideal practices stipulated in DENR (Department of Environment and Natural Resources) Ordinary Minor Forest Products Licensing and ITTO (International Tropical Timber Organization)-FPRDI guidelines in resin tapping.

Contributions of Wildlife to Rural Development in Turkey

Yasin **Ucarli**

Karadeniz Technical University, Faculty of Forestry, Department of Forest Engineering, Turkey

Keywords: wildlife, rural Development, forest management, Turkey

The rural development has become one of the crucial manners in sustainable use of forest and other natural resources. There are strong interactions between the rural development and using type of natural resources because much or less pressure to natural resources depending on the levels of income of rural and urban areas people.

Turkey is on a very strategically located geography which serves as a bridge at the crossroads of Asia, Europe and Africa and also on the Caucasus, Mediterranean and Irano-Anatolian hotspots. Turkey has very rich natural resources and these continents species due to these geographic and climatic features. Throughout the years many civilization used this natural resources, and this usage resulted in the especially many wildlife species have been died out from the Anatolia.

Today's, wildlife-based tourism and recreational usages, hunting tourism, hunting and fishing are the most important using type of wildlife resources and also illegal hunting/collecting of wildlife is made by the local people in Turkey. Local people make hunting and fishing activities mainly for contribution as a source of food, not trade incomes. Many guidelines activities are performed by the local people in the wildlife based tourism activities. There is also some income, nearly one fourth of total incomes supplied in that rural area, giving to local people from the hunting tourism activities. But benefits from recreational use of wildlife resources are rarely returned to local people. Local people in the forestry areas have also been derived benefit from forestry activities such as logging, silvicultural and planting. In Turkey, the clearing of native vegetations, over timber harvesting, illegal logging, fuel wood harvesting, overgrazing, road construction and maintenance, unplanned recreation activities, pest control in farmlands, illegal collecting/harvesting, overhunting, overfishing and pollution of rivers and wetlands are main threats to biodiversity and especially wildlife species.

As a result, wildlife resources are a source of food and income for rural people and critical role for the rural development in Turkey. Community based management must be conducted especially forest management actions for sustainable use of wildlife resources because forest areas are the most crucial habitats for wildlife.

Ergonomic aspects of managing forests for recreational needs. Anthropometric data – do we need them?

Wieslawa L. **Nowacka**

Warsaw Agricultural University, Faculty of Forestry, Department of Forest Utilisation, Poland

Keywords: urban forestry, ergonomics, anthropometrics, recreation

In Poland, similarly to West Europe, forests wasted prevailing role of supplying raw materials. Today's societies, especially urban one, emphasize much more the increasing use of the forest for purposes other than wood production, such as recreation, landscape structuring and conservation.

Today, forest management in Poland, as in many other countries, means the management of multi resources. It appears clear that the forests management would give more emphasis to conservation and recreational targets. Poland as a country which is playing an active role in international undertakings concerning implementation of multifunctional and sustainable management in forestry, is using in practice some criteria and indicators of sustainable forestry formulated in so called "Montreal Process". Criterion 6 is "Maintenance and enhancement of long – term multiple socioeconomic benefits to meet the needs of societies (social benefit- recreation, suburban forests, etc.).

Indicators for recreation and tourism are:

- area and percent of land managed for general recreation and tourism, in relation to the total area of forestland,
- number and type of facilities available for general recreation and tourism, in relation to population and forest area,
- number of visitor days attributed to recreation and tourism, in relation to population and forest area.

Using only such wide indicators in practice is not sufficient. Only a simultaneous solution taking into account both technical elements (use suitable materials, work techniques, etc), as well as organizing, economic, ergonomic factors will allow one to obtain a positive result, that will eventually make possible effective use by participants of all recreational components.

It seems that the main cause of incorrect recreation facilities management is lack of knowledge concerning ergonomics requirements resulting from: physiology, anthropometry, biomechanics, sociology. A straight proof of such conclusion one can find in a new recreation facilities that are on starting point badly designed, inadequately constructed, poorly accomplished, not responding to beneficiaries needs and preferences.

Forest change detection based on satellite image radiometric processing

H. Ferrufino Ugarte[a], Tomasz Zawila-Niedzwiecki[a*], J. R. Santos[b], F. D. Maldonado[c]

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[c] National Institute for Amazonas Research, Brasil
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Keywords:

The paper describes a semi-automated method of satellite data processing which can be used to discover changes in forest cover over time. This is a result of cooperation between University of Applied Sciences in Eberwalde (Germany), National Institute for Space Research in Sao Jose dos Campos (Brasil) and National Institute for Amazonas Research in Manaus (Brasil).

The application of special image processing allows for discovering clear cuts, defoliation and aforestation/reforestation efforts what might be useful in monitoring of forest practices. The illegal cuttings can be monitored as well.

The approach bases on selection of appropriate bands of satellite images and application of radiometric rotation algorithm. Advantage of this method is no necessity of the use of any radiometric correction and simple linear algorithm.

The method has been applied in monitoring of Schorfheide forest area in north Brandenburg (Germany) and Guarayos Amazonian forest in Bolivia.

Forest inventory survey – today and in future

Agata Wencel[a], Pawel Strzelinski[a], Malgorzata Dudzinska[b], Stefan Panka[c*], Tomasz Zawila-Niedzwiecki[d]

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Keywords: laser scanning, inventory surveys, forestry, standing volume, biomass

Technology of laser scanning in the field of nature research is only being used in Poland since 2006. Up to now, most of the measurements and tests have been realised by means of equipment of the FARO company et al. on the area of the forest districts of Milicz, Sławno, Chojna, the experimental forest district Zielonka and the forest district Grodzisk Wielkopolski.

The precision and the utility of the FARO Laser Scanner for inventory surveys in the forestry are proved on a longterm sample plot of the Forest Research Institute in Warsaw that has been monitored since 1900.

The topics of the investigation are:

- coordinates of the trees of the main stand and of the considerably smaller trees of the underwood;

- breast height diameters of all trees of the stand;

- heights of a number of trees that allows the construction of a height curve of the main stand and of the underwood;

- stand basal area of all trees of the stand;

- solid volume of all trees of the stand;

Beside the precision of the results, the time needed and the financial aspect of both the traditional and the FARO survey are compared.

A composition of the technical data of the equipment used during the survey completes the presentation.

Forestry Contractors Research Needs - Contractor survey results lead to research demands for improving health and performance in forest operations

Thomas Brogt[a*], Barrie Hudson[b], Edgar Kastenholz[c], Wieslawa L. Nowacka[d]

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Keywords: contractors, forest wood chain, education, ergonomics, safety and health

As more and more forest operations are outsourced from directly employed workforce to forestry contractors, contractors play an increasingly important role in the forest wood chain, thus offering services to forest owners and securing wood supply for forest based industries. However, they are confronted with various changes such as ongoing mechanisation or long working hours.

As a result, the occupational health problems in forestry work and economic pressure on entrepreneurs are increasing. Current ergonomic research provides answers for healthier working practices which also improve performance. However, putting science into practice is difficult for these businesses who face practical and financial barriers to change their way of working and are not in a position to undertake research and development themselves.

The objective of COMFOR is to transform science into practice by researching and developing methodologies which will encourage small businesses working in forest operations to adopt ergonomically sound working practices. COMFOR will train the Entrepreneur Associations in methods of knowledge transfer, to spread the results of the research to a wide body of European forest operations SMEs.

To identify research demands of forestry contractors, case studies of 10 Core SMEs from three broad European regions of North, West Central and East Central Europe were carried out to establish the research demands of the forest operations industry.

The recent case studies with 10 SMEs in 10 countries show that there is research demand. However, the contractors involved do not directly point out specific research questions to be solved. They are highly oriented on actual problems than on questions taking up long term considerations such as safety and health. Raising awareness is one of the most crucial tasks for further research on knowledge transfer to spread scientific results to forestry contractors. Working together with the ten core SMEs showed that coaching could one of the most appropriate ways to reach the target group. Knowledge transfer channels need to be shaped in a way that communication is face-to-face and not time consuming for contractors.

Geomatic technologies research and education at the Faculty of Forestry at Warsaw Agricultural University

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Keywords: GIS, remote sensing, GPS, geomatics, forestry, research, education

Scientific and education activities of the Division of Spatial Information Systems and Forest Geodesy, which is a part of Department of Forest Management, Geomatics and Forest Economics, in the field of geomatics, are performed in response to increasing need of being informed about natural environment condition and changes. Growing activity of man in natural environment requires all the decisions to be made with respect to the sustainable development. Spatial information is a very important part of almost all decision making processes regarding natural environment, for example in such domains as forestry, spatial planning or environmental protection. Geomatics is actually the most effective technology for collecting and managing spatial information. To get benefits of GIS technology the appropriate knowledge is needed.

The experience of the Division is obtained in different research projects, often conducted in cooperation with forestry related institutions in Poland, for example: General Directorate of State Forest, Bureau of Forest Management, Forest Research Institute and other forestry departments. Wide range of research projects allowed to obtain relevant knowledge needed for development and successful realization of courses for different faculties and interdisciplinary departments. Among the others there are some research activities of the Division especially worth to be mentioned:

- Remote investigation techniques and geographical information systems in environmental analysis with an emphasis on national parks and forests;

- Digital processing of aerial and satellite images along with their interpretation for wildlife management and nature protection;

- Analyzing of the EO technologies as a special tool and source of the information for forest management;

- The use of GIS for localization of outbreak foci of pine insect defoliators.

- Concepts of the technology of development and use of GIS for different levels of environmental management;

- Environmental cartography;

- Multimedia systems and their use in nature education;

- Inventory methods for protected areas and historic parks;

- Data collection and analysis systems for multifunctional forests.

The principles of geomatic technologies education provided by the Division, are based on scientific and educational experience of all the staff and worldwide achievements in methods of collecting, processing and presentation of spatial information for natural environment management purposes. The courses are offered for students of various faculties: more then 11 are taught at the Faculty of Forestry, 16 at various interdisciplinary departments. There are also 6 given in English language for international studies. All of them are delivered in several blocks: geomatics with elements of geodesy, the systems of acquiring and processing of geoinformation data, geographical information systems, remote sensing, cartography, photogrammetry and global positioning systems.

Master and PhD students of the Faculty of Forestry conduct their research in the field of Geomatics in Forestry, in average 12 each year. Few examples of student projects from the wide scope of subjects are listed below:

- GIS application in the nature protection – Bory Tucholskie National Park case study.

- Feasibility study on the application of GIS technology for forest risks maps. - Presentation of greenings stocktaking with 3D visualization on the WAU campus area. - Maps published on websites as a tool for promoting Forest Departments – graphic map analysis.

Recent subjects of PhD thesis were as follows:

- Evaluation methods of forest image maps (2000)

- Investigation methods of forests and protected areas changes (2001)

- GIS supported by Experts Systems and Artificial Neural Networks for forestry purposes (2003)

- GIS utilization for forest fire distribution analysis on the forest district territory (2004)

- GIS for biosphere reserves (2004)

- Spatio-dendrological changes in selected monumental parks in 30 years period (2005).

The poster presents selection of the most interesting results of the Division research activities.

Impacts on forest resources caused by the 'High Speed' train line in Tuscany (Italy)

Fabrizio **D'Aprile**

Monash University, School of Geography and Environmental Science, Australia

Keywords: high speed train line, environmental impact, water resources, forest vegetation

In the recent years, the Tuscan trait (eastern of Florence) of the national 'High Speed Train' line network was built. It runs about 60% below the ground even hundreds of meters deep in the Apennini Alps. Severe impacts on both surface and deep water bodies were verified, which lead to dramatic consequences on forest and freshwater ecosystems also; disappearing of streams, wells, and springs occurred as a major impact. Forest associations proved to be a strong, effective environmental impact indicator in assessing the impact of huge infrastructure development.

Aiming to assess the total damage to forest resources due to the severe diminution of either surface and deep water resources caused by works and tunnels, a basic relevant distinction between forest ecosystems directly depending on the presence of water (i.e. riparian ecosystems, strictly related to surface water resources), and forest ecosystems depending mainly on soil water supply, where soil water may be somehow to deeper water resources (i.e. veins connected to phreatic water), or not, was identified.

The environmental conditions 'ante-operam' were classified as good, and in a number of cases resulted to be very good and rich in biodiversity.

In the 'ante-operam', no differences were found between the areas within and outside the distribution of probability of impact. Grouping of hygrophylous, meso-hygrophylous, and mesophylous species resulted by local field measurements, and the occurrence of the main riparian tree species with respect to other hygrophilous, meso-hygrophylous, and mesophylous species was assessed.

The damage was classified by distinguishing:

- Riparian Ecosystems, damage Type A and Type B;

- Hygrophylous Forest Vegetation not belonging to Riparian Ecosystems;

- Mesophylous Forest Vegetation.

In the 'post-operam', amongst the various kinds of effects observed, the following were most related to forests:

- disappearing of an ecosystem, its animals and plants, and the biological and ecological functions comprehensive of water filtering and depuration;

- severe reduction of biodiversity, ecological patches and landscape, and environmental quality;

- negative effects on the hydraulics of the basins, and increased risk of flooding;

- homogenization of the landscape;

- reduction of the total humidity of the system, and increase of the fire risk;

- reversibility of damage only in a few cases, and only partially, provided that the regimes, amount, and quality of the water flows were restored the same way of the 'ante-operam'.

Investigation of the economical role of Wild pistachio (Pistacia atlantica) forest in rural people life in Iran

Morteza **Pourreza**

Research Center of Agriculture and Natural Resources, Iran

Keywords: pistacia atlantica, economical role, resin, rural, Zagros

Zagros forests are located along the Zagros Mountains from the northwestern to the southeastern of Iran. Oak trees are prevailing in the Zagros forests but the most important trees from economical point of view in rural peoples life, are Wild pistachio (pistacia atlantica) called Baneh in Iran. Wild pistachio trees have the valuable resin called Saqez that it is used for different usage such as industry, medicinal, food and etc. Wild pistachio trees have been utilized to extract resin for a long time and they also are utilized at this time by the rural peoples. In addition of these advantages, wild pistachio fruits are eatable.

Qalajeh forest is a part of the Zagros forest that it is one of the most important sites of wild pistachio in Kermanshah province. The surface of area that covered by pistaia atlantica is about 10000 hectares. In order to have an estimation of amount of utilizable resin of this forest, average number of pistachio trees per hectare was obtained by a randomized systematic way.

After calculating the average of allowed trees for utilizing, amount of utilizable resin was obtained. Results show that the amount of utilizable resin is about 43950 kg. But this amount is for a three-year-period because the Wild pistachio trees must utilize every three years. Since one kilogram of resin has a value about 13$ in 2006, the average value of utilized resin from this forest is more than 500000$ for three years.

Land cover change estimation using GIS: studying climate variables effect

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Keywords:

The scope of this research is to develop a method needed to estimate land cover change and address the complex climate - land cover relationship in a specific study area (Ziethen/Northeast Germany). Previous studies have concluded that the major land cover change driving factor is the human artifact. However, the research was compiled through a statistical analysis of climate variables and a spatial analysis.

For the statistical analysis, the method was based on long time series of daily weather data gathered by Angermünde and Gross Ziethen weather stations. Weather data such as daily maximum and minimum temperature, solar radiation and precipitation will examine climate fluctuation in the region. Spatial analysis was applied using Landsat Thematic Mapper images (Landsat TM) to detect changes in a certain period. Land cover types have been classified successfully using supervised classification referring to ground truth data.

Increasing radiation and temperature variability and moisture limited site in the study area will lead to increase plant stress, especially during the growing months (March, April and May). The results concluded that the dynamic properties in the land cover can be observed

Landscape quality in the area of the river Mundo (Castilla - la Mancha, Spain) and rural development

Manuela A. **Abellan**[a], Manuel E. **Lucas Borja**[a*], Antonio **del Cerro-Barja**[a], Francisco A. G. **Morote**[a], Francisco R. L. **Serrano**[a]

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Keywords: landscape, assessment, GIS, recreation pursuits

The municipal district of Riópar, specifically the source of the river Mundo, is one of the most representative areas of the province of Albacete as far as landscape values are concerned. This has favoured a huge growth in tourism in recent years, which implies a massive influx of visitors to these surroundings and the need to create outdoor leisure areas to accommodate these visitors. Given its huge appeal for the tourist, this landscape therefore becomes an element of territorial management. To date, multiple assessment methods for visual quality by means of landscaping components have been described, such as those by Gómez Orea (1978) and Conesa (1995).

There is general agreement that the landscape is a result of a combination of physical elements such as geomorphology, climate, water, vegetation and fauna, to which the human impact would have to be added as it also has a bearing on landscape quality through all the activities that mankind carries out on the territory. The landscape value or its alteration could be subjectively assessed by an observer, thus the results could vary from one observer to another. Nonetheless, the elements that shape a landscape possess indicators which may be objectifiable, a circumstance which enables the development of assessment methodologies used to plan and arrange the environment while taking the landscape into account at the same time.

In this work, we assess the landscape quality of the source of the river Mundo in the municipal district of Riópar (Albacete) by developing a methodology based on an assessment model included in a Geographic Information System. Special attention has been paid to the zones of this district in which recreation and outdoor leisure areas are located. A more detailed assessment was carried out in these areas since they could affect the landscape more due to the fact that they withstand a greater tourism impact.

Modified pollarding; from an illegal forest degradation to a participatory forest management in Northern Zagros (Kurdistan province of Iran).

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Keywords: participatory forest management, oak, pollarding, fodder, silvopastoral systems

There is a traditional forestry based on native knowledge of local communities in Northern Zagros. It is called Galazani and applied to prepare fodder. Forest and Rangeland Organization (FRO) has tried to stop for more than 30 years. All of these tries failed because of high dependency of local communities on this shape of harvesting. Important weaknesses of Galazani determined by SWOT analysis and their solutions negotiated with local communities.

A participatory object determining process (PODP) was applied to determine the aims of a Multi-Objective, participatory Forest Management Plan. In this plan, Modified pollarding is composed of individual conservation of regenerations to prepare a balanced harvesting and maintenance of the Oaks stands. This plan is accepted by both of FRO and people of rural areas in Alout (a county in Kurdistan province of Iran). Now, There is a traditional forestry based on native knowledge of local communities in Northern Zagros. It is called Galazani and applied to prepare fodder. Forest and Rangeland Organization (FRO) has tried to stop for more than 30 years. All of these tries failed because of high dependency of local communities on this shape of harvesting. Important weaknesses of Galazani determined by SWOT analysis and their solutions negotiated with local communities.

A participatory object determining process (PODP) was applied to determine the aims of a Multi-Objective, participatory Forest Management Plan. In this plan, Modified pollarding is composed of individual conservation of regenerations to prepare a balanced harvesting and maintenance of the Oaks stands. This plan is accepted by both of FRO and people of rural areas in Alout (a county in Kurdistan province of Iran). Now, some local foresters have executed this plan in their conventional forests as the pioneer volunteers.

Qualification training for forestry service works employee from rural areas

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Keywords: rural areas, courses, forestry service, workers, employment

August Cieszkowski Agricultural University of Poznan is organizing a project whose aim is professional training for forestry service works employee. Where 80% of this project's costs are founded by the European Social Found (ESF) and the other 20% is covered by participants. The main goal of this project is to increase qualification of the forestry services works employee and owners, especially by creating and increasing technical skills and introducing new high-tech solutions and communication between university institutions and foresters. One of the project's aims is to instruct approximately sixteen hundred people where more than 80% of participants will originate from rural areas.

Recreational opportunities in Rychtal Forests in the context of rural development

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Keywords: recreation, tourism, rural development, Rychtal Forests

Tourism and recreation may help in development of local communities especially in regions which do not have strongly developed industry and agriculture. An example of such area is the Forest Promotional Complex The Rychtal Forests (47 600 ha). It is located in the southern Wielkopolska (central Poland). The biggest part of the area is covered by agricultural lands (over 70%) and forests (about 20%). There are no big cities or industry centers there. Nature is rich; there are a lot of nature reserves, old trees, and rare habitats. The area abounds in places of cultural and historical character. Despite of undoubted attractions, the area is still not very popular.

However there are a lot of problems, which have to be overcome in order to benefit from tourism in the Rychtal Forests. There is no necessary infrastructure (tourist routes, places for rest, accommodation base). A lot of institutions manage the region (30 local communities, 2 forest districts, Experimental Forest District, Promotional Forest Complex). There are no funds for accomplishment of the plans (creating of infrastructure, investments in accommodation, promotion). Therefore the aim of this work is: 1) analysis of existing bottlenecks connected with the project and 2) description of possible solutions in ecological, economic and organizational aspects.

The example of successful undertaking in the field of tourism on forest areas is French Project - Retrouvance. It has been tested in the department Hautes Alpes since 1996. Retrouvance is a program based on common values of forests and non-forests areas. It is a proposal of week-long route. The aim of the route is to discover nature. Retrouvance is based on proper relationships between visitors and hosts. It respects natural environment.

Following the example of Retrouvance, the project “Discovering the Rychtal Forests” was implemented in 2005. The aim of the project is maintaining cultural heritage of rural areas, participation in local development and high quality tourist services. Its aim is increase of tourist attractiveness of the region and simultaneously maintaining sustainability.

The first stage of the project were organizational and informational activities. During seminars in which participated local communities, The State Forests units, organizers of tourism, the idea of development of tourism in region was presented. Interested institutions started to cooperate. The second stage was initial valuation of areas done by individual local communities, and pointing out places attractive for tourists and existing tourist infrastructure. Information system encompassing the whole area of the Rychtal Forests was created with use of GIS. The next stage was data verification in the field according to explicitly approved rules done by forestry students during scientific camp. Each object was described in standard forms. Actions taken so far are only initial stage of this project.

Research on the impact of gender on forest management in contemporary Swedish family forestry

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Keywords: gender, forest management, forest ownership, Sweden

For a sustainable development, it is important to study economic activities and institutions governing them since they affect both environmental and social states. Forest land ownership is an economic activity and one crucial concept for a better understanding of forest ownership and management, is gender. In contemporary Swedish family forest ownership gender has an impact on; whether an heir has taken over the property or not, whether the forest estate is singly or jointly owned, and on the size of the property. Gender order is also expressed in terms of the work on the property.

Research shows that there are differences in male and female forest owners felling activity. This induces to ask if the differences in management behaviour also are a result of the gender order. The overall aim with this research project is to examine why female forest owners harvest less timber compared to male forest owners, testing the following hypotheses: I) The forest yield conditions are poorer on female owned holdings. II) Female forest owners have another incentive structure when it comes to felling, as a result of their inheritance position. III) Female forest owners are to a larger extent than male owners inclined to produce other forest values than industrial roundwood.

Rural development by afforestation in agricultural areas: a comparison of two areas in Albacete (Spain)

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Keywords:

The role of forests and their contribution to sustainable development has been the subject of intense debate by governments and policy makers around the world. The objectives of forestry policy are increasingly driven by factors that are external to the sector.

A major part of the territory of the European Union consists of rural areas, where agriculture has represented the most important source of income and employment during last years with support of Union's Common Agricultural Policy. At present, with an increasing urbanisation and declining agriculture, primary production is loosing their predominance and the manufacturing and service sectors are increasing in importance. Primary production is not any longer the pillar of the countryside, due to causes as, e.g. overproduction and free-market politics. The impact of these different transformations on European countryside is quite variable.

On the other hand, considerable attention is given to a European policy on rural development. Originally, this policy was mainly concerned with the modernisation of agricultural practices, but at present it also concerns the need to sustain a healthy countryside. It can be said that this policy constitutes the second pillar of the European Union's Common Agricultural Policy.

Within of this new policy, forestry is increasingly recognised as one of the activities to be taken into account in rural development strategies. In the past, most attention was focused on the primary production function of forests in order to stimulate the economic development of rural areas. At present the role of forestry is gradually changing with increasing attention being given to its ecological and amenity services. Multifunctional Forest Ecosystem Management can provide different employments and incomes for rural societies

In this context, the European Union is apply different scheme afforestation on arable and degraded land. This policy has resulted in contrasted perception in rural societies.

This study explores the agricultural and forestry sector characteristics and the perceptions of landowners in the Albacete region (Spain) regarding forest planting and forest policy related issues as well as how new forests are accepted in comparison with traditional agricultural land use. Results of a landowner comparative survey undertaken in two contrasted rural areas in Albacete (Spain), aim at understanding why local landowner groups are reluctant to the planting of land with trees. This is partly attributed to the long-term agrarian character of these areas. For some landowners, forestry is envisaged as antagonistic, rather than synergetic to agriculture and thus not socially acceptable.

Silvicultural methods of increasing of sustainability of forest stands, with special focus on afforestations

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Keywords: afforestation, Scots pine, tending cuts, initial density, species composition

Research projects carried out by the Silviculture Department in the last years concern suitable initial density and choice of the selection thinning method applied to pine stands. These aspects play important role in the formation of the sustainable forest stands, especially growing on the post agriculture lands. In the past, farmlands were regularly afforested with Scots pine because of high timber production. Due to quick afforestation of land, forest stands were unstable and very often prone to various kinds of diseases.

Silvicultural methods, which are to serve formation of sustainable and highly biologically diversified forest ecosystems, are presented. Taking into consideration economical, protective and social functions of forest stands much attention is being paid to the differentiation of silvicultural management depending on management goals. The most important silvicultural instruments are: suitable initial density and choice of species depending on climatic and habitat conditions, appropriate tending treatments, regeneration method and conversion of damaged stands.

In this paper the previously established spacing and thinning experiments are used as a case study. Because the effect of the initial density of a stand on its growth is equally important as the felling itself the methodological postulate that thinning experiments should be carried out in the stands established from planting under the known spacing regime seems justified. In the case of stands varying in initial density it is possible to research the effect of the both factors (density and thinning) on the growth, stability and productivity of a stand. The objective of these studies is to evaluate the growth dynamic of the young generation of Scots pine stands to which various initial density have been applied. The second objective is to compare the effects of the traditional method of selective thinning and some of its currently used thinning versions on the growth of a pine stand in age class II.

Socio-economic survey to identify the major constraints in afforestation of the degraded forest in Shankargarh, Allahabad, India

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Keywords:

The Shankargarh area of Allahabad District of India has been gifted with huge resources of Silica, a major mineral used in glass industry. Looking to the quality of the silica deposits that are found here, it is gained wide economic importance and a major source of district revenue. Mining operation, undoubtedly has brought wealth and employment opportunity in the area, but simultaneously has lead to extensive environmental degradation and erosion of traditional values in the society. The major victims are the local forests.

Therefore, a holistic and integrated approach is needed to reclaim the site, which involve the judicious choice of tree species; soil health and community participation. Moreover the adjacent communities of the silica mining area are socially and economically stratified and such barriers may come in the way of successful implementation of reclamation projects. Societal benefits should also be considered for reclamation.

Therefore a survey was conducted in nearby area of silica mines through questionnaire-based interviews to study the socio-economic status of the local people. Questionnaire had two parts. The first part had the questions seeking the personal information about the respondent and the second part had subjective questions, which were designed so that the information regarding their perception about forestry, their awareness about their surroundings, and their level of responsibility for reclamation, from general to specific nature was obtained. These data not only provided information about their socio-economic structure and views but also was helpful to identify the major constraints of the local populace for reforestation of the area.

This information may be further used to overcome these constraints and to involve the people in afforestation of the area sustainably by involving the local people.

Terrestrial laser scanning in forest ecosystem analysis

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Keywords: laser scaning, forestry, forest ecosystems

Terrestrial lidar scanning has been using in Polish forestry since 2006 only but preliminary results are very promising. The technology has been applied to tree parameters measurements, standwise inventory and ecosystem analysis.

This paper describes the project on fir spread in north Poland (Baltic forest ecoregion). FARO LS 880 scanner was used for rectangular (12,5 x 12,5 m) plot registration from four corner locations, what allows for visualisation of the area of 1962 m2. Each measurement point was also registered with the se of digital camera integrated with laser scanner.

These data permitted building up the 3 dimensional model of analysed forest stand. Such model is used not only for inventory purposes but also to evaluate the influence of canopy closure and under-storey vegetation on fir tree regeneration.

The Center of Forestry Weihenstephan: structure, resources and potential for joint research and application studies

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Keywords: forest research, Center of Forestry, international collaboration

Since 2003 three strong partners build the "Center of Forestry Weihenstephan": the School of Forest Science and Resource Management (Technical University Munich), the Faculty of Forest Science and Forestry (University of Applied Sciences Weihenstephan, and the Bavar-ian State Forest Institute. Located closely to each other they share their individual expertise and resources, so that the Center covers at one single place all aspects of forestry for the bene-fit of in-house cooperation and external partnerships.

The Center's structure and its fields of competence in research, monitoring, inventory, con-sulting, knowledge transfer, and academic and practice-oriented education and training will be shown and possibilities for international collaboration discussed.

The changes of wood species used in wood constructions of Masovia churches from XVI to XX century

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Keywords: construction wood, antique churches, Masovia, pine, oak

Thirty-one churches located in Mazowsze region of Poland were examined for wood species used for their structures. The entire number included: 26 all-wood churches; 3 brick-wall churches with wooden roof structures; 2 objects with partially wooden walls. The entire number included: 2 churches from XVI c., 9 churches from XVII c,. 17 churches from 17 c., 1 church from XIX c. and 2 churches from XX c.

The numbers of samples were: 536 samples from large-size structure components, and 144 samples from joining components, making a total of 680 samples. Sample wood species were determined. A nearly exclusive presence of Pine (Pinus sylvestris) was found for the large-size structural components for walls and rafter framing for the period of 16th – 19th c., if foundation beams form other wood species in some objects are disregarded. Further, it was found that the 18th c. was specific for deviation from using hard deciduous wood (Oak - Quercus robur , Ash – Fraxinus excelsior) for manufacture of joining components for walls and for rafter framing, which was specific for the 16th and 17th century. This tendency goes in line with simplification of roof structure compared to those designed until that time.

So far, examinations have provided with evidence of carpenter handcraft decline in Mazowsze from the 18th century on, with not only more and more primitive design of the roof structure, but also with a less appropriate selection of wood species used for wall tenons and for roof structure pegs. In this research stage, it would be hard to unmistakably tell the deforestation share among the reasons of such situation.

The economic effectiveness of shelterbelts created from best poplar cultivars

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Keywords: economic effectiveness, shelterbelts, poplar cultivars

The shelterbelts are very important to protection of the rural lands from erosion and other unfavorable outside influence as well as to increase the crop yields. The mean increase of crop yields in forest steppe zone with hard environments is 2.8 centers/ha. There are other figures for different region of Russia.

The necessity of shelterbelts in Russia is 14 mln. ha. There are more than 3 mln ha. The most part of them are presented by shelterbelts. They protect about 30 mln. ha of agricultural lands from erosion processes and have big economic effect.

The assessments of economic effect of shelterbelts were undertaken repeatedly. There were taken into account common incomes from increase of crop yield on protection land and expenses and losses connected to creation of forest stands and alienation of arable lands for shelterbelts. There are the data of incomes on one ruble of expenses. Now that figures are another but enough great.

Sufficiently increase of shelterbelts effectiveness is possible by introduction in stands the best cultivars of poplars. The calculations show that effectiveness in that cases would be increase in 1.5 and more times.

For creation of shelterbelts were selected fast-growing and frost resistant native (‘Pioneer’, ‘Russky’, ‘Pyramidalno-Osokorevy Kamyshinsky’, ‘Voronezhsky Giant’, ‘Stepnaja Lada’ a. o.) and introduction (‘Robusta’, ‘Bacheliery’, ‘Vernirubens’, ‘Brabantica-175’, ‘Sacrau-59’ a. o.) poplars.

There is attempt in proposed presentation to give objective contemporary assessment of shelterbelts effectiveness in forest-steppe zone.

The integration of forestry into rural development planning in Armenia

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Keywords: forestry, rural development, planning

The forest ecosystems represent an indispensable element of Armenia's rural landscape contributing various tangible (wood supply, fruits and herbs), and intangible benefits (anti-erosion factor, clean air and water, recreation, etc.). However, often poorly planned and ill-implemented forest operations, in particular, commercial activities impoverish wood resources as well as reduce the forest biodiversity and soil wealth through the selection and cutting of the best trees, improper timber removal techniques, and chaotic building of the forest roads. The widespread illegal logging, irregular grazing and game poaching add to depletion of the forest resources. Additionally, unsatisfactory connections among forestry and other segments of the rural economy (mainly agriculture, transportation and mining) has resulted in lesser attention to inter-sectoral problems such as degradation of agricultural lands, water and wind erosion, livestock grazing, and haymaking in the forests.

The coordination between the forest administration, communities and private farmers should be strengthened by establishing a mechanism to develop, promote and monitor current land-use management procedures. These procedures should be instrumental for integrating agriculture land improvement and pasture management programs into forestry activities on communal and private lands, including afforestation for wood production, rehabilitation of degraded vegetation and lands, and facilitation of agroforestry via shelterbelts and windbreaks. The procedures could be enacted at local levels by the Forest Extension Service, which would be involved in the formulation, implementation and quality control of the land-use activities.

Currently the resource allocations to reduce erosion and increase production on degraded land through afforestation are constrained. Further degradation of these lands will reduce the future production potential of natural resources, due to intensified erosion of the farmlands, and reduction of economic lives of irrigation and hydro-electric dams. However, to justify the required investments for afforestation purposes would be difficult. Therefore a better linkage among watershed management and rural areas development should be sought. In particular, for watershed management on former agricultural land, the forest administration could either carry out afforestation and/or provide extension to private farmers. Both in terms of forestry activities on agricultural land and afforestation of degraded lands, the state budgetary funding would have to be considered, as is the case in most countries.

The present method for strategic planning of the forest resources should be strengthened by comprehensive balancing of relevant commercial, environmental and social aspects of the rural development plans. This would facilitate the decision-making process associated with soil and water conservation, biodiversity, recreation, and public ecological sentiments on the one hand; and commercial and social considerations of primary and secondary forest industries, mining, housing, and transportation on the other hand. An integrated research program, which would provide a comprehensive economic and social evaluation of the multiple aspects and potential benefits of the forest sector, could be an essential prerequisite for the efficient allocation of resources to the sector within rural rehabilitation and development agendas.

The regeneration process of Pinus nigra Arn. in Cuenca (Spain); a problem for sustainable forest management and rural development

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Keywords: regeneration, rural development, Pinus nigra Arn., soil treatment

The Black pine (Pinus nigra Arn. ssp. salzmannii (Dunal) Franco) grows in the eastern half of Spain, normally on calcareous soils, although it can thrive on siliceous soils. According to data from the Second National Forest Inventory (1986-1996), Black pine may be found in all the Regions of Spain except Extremadura, Asturias, and the Balearic and Canary Islands. Of the 13,904,659.61 ha of forest in Spain, Black pine occupies about 10% (3% being pure pine stands and 7% mixed forest). In Spain, the Province of Cuenca has the greatest area of Pinus nigra Arn. ssp. Salzmannii. Specifically, 142,036.84 ha are pure stands of Pinus nigra, 104,688.94 ha are mixed stands, 26,275.98 ha are mixed Pinus sylvestris–P. nigra, 20,606.67 ha are Juniperus thurifera–P. nigra and 57,806.30 ha are P. nigra–other species.

The great majority of all forest management plans regarding Black pine that have been carried out in Serranía de Cuenca in the past century propose a structure of even-aged stands. The proposed method for these plans is named “transforming management”, using a shelterwood system: a 100–120-year rotation and 20–30-year regeneration period. The most striking characteristic of this method concerning the regeneration of forest stand in order to achieve seedlings in the regeneration period is its inflexibility.

Therefore, understanding of natural regeneration is fundamental for planning regeneration, and an understanding of plant dynamics must also be the base upon which any forest management decision is made. In accordance with the persistence principle for forest stands, as stated in the definition of silviculture, regeneration at the mature stage is the most important forestry activity, and stand treatments are designed and organised in relation to this.

On this context, the problem of the defective regeneration of Black pine (Pinus nigra Arnold) is the main obstacle to stands’ sustainable management and rural development. Planting is not a desired solution because its high cost and the trends of forest policy. A solution may be achieve an advanced regeneration before the fellings based on the seedlings’ tolerance, improving the seedbed by soil treatments and managing a good canopy by thinnings.

This work analyses the effect of two soil treatments and different stand densities on the germination and survival of P. nigra seedlings at 6 sites in the Serranía de Cuenca (Spain). Scalping and screefing improved the survival of seedlings from natural dissemination between 6.94% and 10.21%, and between 0.75% and 4.02%, respectively. An increase in basal area (as a measure of stand density), was accompanied by an increase in survival under the conditions that prevailed during the study.

The role of “Wroclaw County Programme for the Augmentation of Forest Cover” in integrated and balanced development of the city

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Keywords: afforestation, forest cover, spatial planning, GIS

The basis for all afforestation activity in Poland is “National Programme for the Augmentation of Forest Cover”. Its main task is to increase the forest cover to 30% by 2020 and 33% by 2050. Ecological and economic priorities together with tools for their implementation are also established in that document.

With reference to the national one, local programme for Wroclaw County has been elaborated as a result of large city needs. Total area foreseen for afforestation for the years 2006 – 2028 is 1106 ha. In the first implementation phase (2006 – 2015) afforestation of 486 ha was planned and in the second one (2016 – 2028) – 620 ha. Enforcement of these tasks will increase the forest cover of the city from 7,7% in 2006 to 11,6% in 2028. The successive selection of parcels planned for afforestation has taken ecological, environmental, economic and city-planning aspects into consideration. The final choice was done by using modern methods of collecting, transforming and selecting data – GIS. The programme was adopted for implementation by the Town Council in 2006 as a basis for local spatial planning. Now it is one of the most important urban development programmes in Wroclaw.

The role of forestry in the socio-economic development of Poland's agricultural region (input-output analysis)

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Keywords: forestry in Poland, socio-economic development, input-output analysis

The study was undertaken in the region of Bialowieza, Browsk, and Hajnowka Forest District Administrations (FDAs), which has a total area of 52 thousand hectares and is situated in the agricultural zone of north-eastern Poland. The study used an input-output analysis to explore: 1) the type and strength of relationships between forest management and its socio-economic environment, and 2) the role and significance of forestry in the development of the region.

The forest sector (FDAs) employed 452 people, with salaries totalling USD 1.6 million/yr. FDAs supplied the environment with the generated cash flows (taxes and dues) amounting to USD 4.8 million/yr, enabling creation of 322 jobs outside forestry. FDAs supplied goods and services for the amount of USD 5.2 million/yr, mainly revenues from the sale of 120,000 m3 of harvested wood. The wood-processing industry employed 1,111 people, and was also a source of taxes and dues amounting to USD 1.7 million/yr. Fifteen jobs were created per 1,000 m3 of harvested, sold, and processed wood: 2 in FDAs, 4 in the firms providing goods and services, and 9 in the recipients of goods and services. Simultaneously, this was a source of taxes amounting to USD 26.0/yr, of which USD 11.0 thousand/yr was paid by FDAs, USD 1.4 thousand/yr by the environment of suppliers, and USD 13.6 thousand/yr by the environment of recipients.

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Alphabetical list of authors

Author's activities description (n denotes session Id):

MOD-n: session moderator, KEY: key-note speaker, PAN: panelist, PRE-n: oral presentation, POS: poster presentation

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