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Forests and Society

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Responsible for the contents of each contribution is the respective author.

Editorial Remark:

The forum was open to various kinds of contributions by participants. Contributions were made in form of statements, abstracts of papers, scientific papers and posters. This publication includes all these various kinds of contributions without attempt to create a unified format. Some texts were slightly modified by the editors, mainly in order to overcome language problems, and the text was not revised again by the author. It was not meant to change the contents, but if the modification resulted in a different meaning, it is solely the responsibility of the editors.

Editors: Dr. Jutta Poker, Inge Stein

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Cover: "Ivy-Lady", a character of the Walddörfer Spirits of the Forest by Heidrun Parsian
Titelbild: „Efeu-Lady“, eine Figur der Walddörfer Waldgeister von Heidrun Parsian



Forstwirtschaft
in Niedersachsen



Alfred Toepfer Akademie
für Naturschutz



Landkreis
Soltau-Fallingb. Ostel



Schutzgemeinschaft
Deutscher Wald

NNA Reports

Volume 12, Special Issue 5, 1999

Contents

Page

Introduction of 'Forests in Focus'		2
Innes, John	Forum Report and Recommendations	3
Congress Programme		8
Schreiner, Johann	Opening Address	9
Greifelt, Werner	Welcoming Address on behalf of the Minister of Lower Saxony, Mr. Uwe Bartels	9
Gottlob, Thomas	Welcoming Address on behalf of the Federal Minister, Mr. Karl-Heinz Funke	11
Key-notes		
Salleh, M.N.	Humankind in Nature	13
Ramani, K.V.	Forestry and Energy: Review of Issues and Policies	14
John Joseph, S.	Biodiversity in Forests – A Treasure of Ecological and Human Communities: Concept and Practice of Current Use	18
Mantau, Udo	Risks and Chances to Market Recreational and Environmental Goods and Services – Experiences from a Hundred Case Studies	30
Rollinson, Tim	Forests as Source of Raw Materials	36
Weber, Gunter	Wood as a Natural Resource – Innovative Design for Chemical Products as a Contribution to Sustainable Development	38
Killmann, Wulf	Forestry at the Turn of the Millennium – Challenges Ahead	44
Ammour, Tania	The Potential of Educational and Outreach Programmes for Public Awareness and Adoption of Practices for Forest/Natural Resource Sustainable Use	48
Round Table: Funding within the Framework of International Processes Aiming at the Conservation and Development of the World's Forests		
Falkenberg, Claus-Michael	New and Innovative Financing Mechanisms for Sustainable Forestry	56
Michaelowa, Axel	The Role of Forestry in the Flexible Mechanisms of the Kyoto Protocol	57
Hinz, Burkhard	Financial Co-operation with Developing Countries: Resource Conservation Projects	58
Göbbling, Stefan	Communicating, Financing, and Preserving Forests – Blueprint for an Integrated Conservation Strategy	58
Podium Discussion: The Role of the Media in Environmental Communication		
Cerovský, Jan	The Debate on Sustainable Forestry in the Media of the Czech Republic	65
Griesel, Frank	The Dog attends to his Master, not the Other Way Around	67
Kürsten, Ernst	The Image of German Forestry on the Internet	68
Mato, Xhemal	Massmedia Facing the Deforestation Problem in Albania	68
Stoica, Dan	The Image of Forests in Romanian Media During the Transition Period to Market Economy	70
Podium Discussion: Methods to Raise Public Awareness and Strategies to Strengthen Public Participation in Forest Issues		
Brüggemann, Jens	Pro Public Participation: Potentials and Pitfalls	71
Pretzsch, Jürgen	Forestry between Participation and State Management. Case Studies from Mexico, Guatemala, India. Pleading for a Change in Paradigms	73
Pudlis, Eugeniusz	Promotional Forest Complexes in Poland Create a New Image of Polish Foresters	78
Teplyakov, Victor K.	Creating a Framework for Public Involvement in Forest Management Decision Making in Russia	79
Additional Contributions		
Fierro, Rosa Amelia	Amazonia under Threat	82
Hobusch, Erich	The "Forest History Collections in Fürstenberg/Havel" Project	84
Knobloch, Jochen	The Image of the Forest in German Print Media	85
Claassen, André	Stichting Robinia – Background and Goals	86

FORESTS IN FOCUS

**within the framework of 'WELTFORUM WALD',
official project of the World Exposition 2000**

A series of fora focusing on global forests issues aims at achieving consensus among relevant interest parties on tools and concepts to sustainably develop the world's forests. The project 'Forests in Focus' adds operative recommendations for solving environmental problems concerning forests to current political negotiations and scientific meetings in the field of forestry. The fora act as an agent between politics, economics, science and public and provide condensed up-to-date knowledge as well as agreed upon proposals for action adequate to target groups. Thus, 'Forests in Focus' supports the local implementation of guidelines on forest management and enforces the forest related parts of the Agenda 21 process.

Background

The World Exposition 'EXPO 2000 Hannover' presents the concept of sustainable development as agreed upon in the Agenda 21 at the UNCED 1992 in Rio de Janeiro. EXPO 2000 includes various worldwide decentralised projects. One of these, 'WELTFORUM WALD' (World Forum on Forests) has been initiated by authorities of the district Soltau-Fallingb., Northern Germany, the Association for the Protection of Forests and Woodlands (SDW), the Forestry Commission of Lower Saxony and

the Alfred Toepfer Academy for Nature Conservation (NNA).

The project includes various activities and exemplary projects demonstrating sustainable management and use of forests to local people and international visitors (reafforestation of degraded heathland, redevelopment of former military areas, environmentally sound wooden buildings, thermal use of wood, use of non-timber products, management of a nature reserve and tourism, etc.).

Within this frame, 'Forests in Focus' forms the professional backbone. The fora address institutions and social parties concerned with forests, particularly those which

- are directly connected to forests,
- play an active role in forest management
- are affected by forest management.

The fora intend to encourage the relevant social parties to participate efficiently in decision making on forest issues, thus promoting the worldwide implementation of the recommendations of the Agenda 21.

Auspices

'Forests in Focus' is performed under the auspices of the Federal Minister of Food, Agriculture, and Forestry, Mr. Karl-Heinz Funke.

Time Schedule

Between 1998 and 2000, five fora take place. With respect to the multiple functions of forests, the fora focus from different perspectives on the worldwide sustainable co-existence of mankind and forest:

Forests and Energy (To what extent can forests contribute to the world's future energy supply?) January, 1998

Biodiversity – Treasures in the World's Forests (Prospects of conservation, use and sustainable development of biodiversity in forests) July, 1998

Forests – Source of Raw Material (Potentials of forest products' use and marketing) May, 1999

Forests and Atmosphere-Water-Soil (Regulation of energy and matter cycles with respect to climate change, water cycles and soil degradation) July, 1999

Forests and Society (Interrelation of cultures and environment, public awareness, public participation; integration of recommendations of the former fora) November, 1999

The final events will be the presentations of the results and recommendations of all fora at the EXPO 2000 in Hannover in Summer 2000 and at the congress **Sustainability in Time and Space** – in cooperation with PRO SILVA (Implementation of forest management guidelines in divergent forest types.) 2 – 7 June, 2000.

Forests and Society – Forum Report and Recommendations

Chairmen:

Prof. John Innes, University of British Columbia, Vancouver, Canada
Dato' Dr.M.N. Salleh, Malaysian Nature Society, TROPBIO Res. SDN BHD, Kuala Lumpur, Malaysia

The fifth and final World Forest Forum was held at Soltau in Lower Saxony, Germany, from 26 to 28 November 1999. The fora were organised as events leading up to the EXPO 2000 Hanover World Exposition. The fifth forum was attended by 87 participants from a total of 18 countries. Its aim was to summarise the findings of the previous fora and to identify mechanisms by which the findings could be better incorporated into the needs of society.

The forum was organised into four parts. These are summarised separately. Throughout the forum, the links between forests and society were stressed. In this respect, it is worth remembering that in the 80 years that it would take for a Norway spruce to reach harvestable age, the World's population is projected to double. With an annual population increase of 85-90 million and annual per capita wood consumption of 0.7 m³, the annual increase in global demand for wood is estimated to be 60-65 million m³. Even if this demand could be met, the priority for most countries will be hunger elimination, poverty reduction and debt service, not sustainable forest management. This presents a major challenge to the entire community concerned with forests. Forests must not only supply wood. They must fulfil many other functions. There has been an assumption that foresters best know what these functions are, but it is now emerging that many of the social functions, including the aesthetic, cultural and spiritual services that forests supply, are inadequately understood and valued. Consequently, many disciplines should have greater involvement in forest management. Members of society have a role to play in helping resource managers formulate management policies that help to meet these needs.

Funding within the framework of international processes aiming at the conservation and development of the World's forests.

The aim of this round table discussion was to examine the various funding mechanisms associated with international agreements such as the Framework Convention on Climate Change and the Convention on Biological Diversity. Considerable uncertainty surrounds the funding of sustainable forest management and all that it involves, particularly in the less developed countries. An example is the Global Environment Facility (GEF), used to fund some of the activities being undertaken under the Convention on Biological Diversity. As the conservation of biodiversity is one of the aims of sustainable forest management, there is the potential for GEF funds to be used in this context.

Development organisations have funds available, but some have experienced difficulty utilising these funds, as the necessary infrastructure is not sufficiently developed in the recipient countries. However, absence of infrastructure should not stop funding; the initial funding should be to develop that infrastructure. Many donor programmes are short-term, and do not provide adequate provision for the long-term maintenance of the benefit. For example, why money can be given to buy a school, money is also needed to pay for teachers and textbooks, and pay for the maintenance of the buildings.

"Debts for Nature" represent one possible mechanism, but the only groups that have shown willingness to buy these have been US NGOs, and then only for arrangements in Latin America, primarily Costa Rica and Honduras.

The steps introduced in the Kyoto Protocol provide a potential opportunity

for funding, particularly through Joint Implementation (JI) and the Clean Development Mechanism (CDM). Discussion about the use of these mechanisms to fund forestry operations has become polarised with, for example, Latin American and African countries favouring the CDM as a funding mechanism and the EU and environmental NGOs being against it. Under Art. 3.3 of the Kyoto Protocol, countries have to account for emissions and sequestration from "afforestation, reforestation and deforestation" during the respective commitment period, taking the values of 1990 as baseline. It is as yet unclear, in how far forest management and protection will be included. A number of issues will have to be resolved before forestry projects are generally accepted, including:

- terms and definitions
- guidelines for the implementation, monitoring and evaluation of the flexible mechanisms
- coverage of accidental releases of stored carbon (e.g. by forest fires);
- refinement of greenhouse gas measurement and monitoring methods, especially in relation to below-ground carbon;
- refinement of methods for calculating baselines for forestry projects;
- problems associated with the long time span of forestry projects, that prevent the land being used for other purposes; and
- clarification of accounting methods for wood products.

It is assumed that the IPCC-special report, to be submitted in May, 2000, will answer some of these questions.

Keynotes on the theme "Forests and Society"

Those concerned with forests are experiencing a period of profound change. Foresters and others are being increasingly required to view forests as more than a provider of timber and a provider of raw materials. This is illustrated by the historical development of forestry in Europe:

- 1940s and 1950s
concentration on industrial wood production
- 1960s and 1970s
concentration on wood quality
- 1980s and 1990s

concentration on environmental issues

2000 and on

concentration on social issues

As a result of these changes, all those concerned with forests must consider the entire range of services provided by forests. These include the conservation of biodiversity, the saving of endangered species, the sequestration of global carbon, the provision of adequate clean water, the provision of recreation opportunities and the rehabilitation of degraded lands. These represent exciting new challenges for foresters and other resource managers but, in many countries, the forestry profession is failing to attract the best students. This is a situation requiring immediate action. The profession needs to put in place professional registration regulations, codes of professional conduct, professional codes of practice and professional standards that all must adhere to and respect. Such standards also need to be introduced to other professions dealing with forests, including those in the ecological, economic and social sciences. All disciplines working with forests need to re-orient their training to focus on the sustainable management of forests.

A number of specific challenges can be identified, including:

- striking a balance between forestry and other land uses;
- making sustainable forest management more profitable;
- strengthening the implementation of national forest policies;
- achieving greater participation of stakeholders in benefits from forests;
- providing financing mechanisms for sustainable forest management;
- establishing a world-wide resource assessment and monitoring system;
- preparing for the impacts of global warming;
- developing sustainable energy systems;
- intensifying secondary forest and plantation management; and
- bringing the levels of the international policy debate and the field reality closer together.

For sustainable forest management to function effectively, there are a number of a needs to be fulfilled, including

political will and co-operation, education, research and extension, participation of the people, an appropriate institutional framework and improved information access. Foresters have been slow to utilise modern communication technology to improve information access. For example, although the UK Forestry Commission argues strongly for public feedback in its forest planning exercises, not one of its plans are available through the Internet. There is a need for forest managers and forest scientists to look outwards towards the needs of society: they should start listening to the public and stop trying to educate them. There is also a need for them to start putting into practice what they now recognise and state as important.

The advent of increased public participation will change the approach to forest management. Until now, there has been a feeling that "foresters know best about forest management". This view is not shared by everyone, and indeed is questionable given past mistakes. Other disciplines are demonstrating that they can make a significant contribution to the sustainable management of forests, and need to more involved with forest management. Greater involvement of all those concerned will result in progress towards the goal of socially oriented sustainable forestry.

Forests and energy

Wood is a critical source of energy in many countries, with the majority of woodfuels being used in the domestic sector. Estimates of sources and consumption patterns are plagued by difficulties associated with data collection and interpretation, but it is apparent that in the Asia Pacific region, cutting for woodfuel is not a major cause of deforestation. However, in Africa and much of Latin America, woodfuel is a significant cause of deforestation. This pressure on forests is a direct result of the pressure on people caused by poverty. To solve the problem of over-cutting, the problem of poverty first needs to be solved. In terms of energy sustainability, there is a need to look not only at environmental and intergenerational equity, but also at intra-generational equity: the needs of people today have to be met, as well as the needs of the people in future. The use of woodfuels in preference to fossil fuels has positive benefits

for the environment, particularly in relation to emissions of carbon dioxide, and substitution of woodfuels by fossil fuels is economically and environmentally undesirable. However, suitable technology needs to be developed to improve the efficiency of burning, thereby decreasing demand and reducing the impacts of other emissions from wood burning, particularly those associated with human health hazards. In this respect, it is important to note that those most at risk are women and young children. Several ways to improve the situation are available, including supply-side options (reforestation, agroforestry, plantations etc.), demand-side measures (large-scale biogas operations, wood gasification, efficient cooking utensils, modifications to building architecture etc.) and integrated systems.

Within Europe, the use of wood as a source of bioenergy is being intensively studied. A number of factors may make the adoption of this source of energy more difficult, particularly the intense competition in the energy market. Despite this wood offers a number of advantages over fossil fuels, including climate protection and carbon dioxide reduction. It has huge theoretical and technical potential and may become increasingly important as fossil fuels become progressively exhausted and the controversy over nuclear fuels continues. Several mechanisms could increase the use of alternative energy sources, including government price regulation, regulated competition and market-driven processes such as green pricing.

Biodiversity- Treasure's in the World's forests

Biodiversity was the theme of the second forum. It is clear that the full potential of the scientific community has not yet been realised. Traditional forest-related knowledge and traditional ecological knowledge offers many insights that have yet to be fully utilised. There is also a need to capture the cultural, spiritual and functional values of biodiversity. This needs to be done with great care and sensitivity and it is apparent that ill-planned attempts to conserve biodiversity in some areas have alienated the forestry administrations from the local populations. A number of themes were addressed, including:

- There is a divergence between how "western" science sees biodiversity and how local communities view it. The latter tend not to see species lists, rather they see biodiversity in terms of assemblages of species and attach values to the ecological services they provide and their many uses.
- Loss of cultures and languages is eroding our knowledge of biodiversity.
- There is still discussion of the relative merits of integrating biodiversity conservation across all forms of managed forests or creating a system of reserves and intensive plantation management.
- Globalisation and information technology will affect biodiversity conservation. Globalisation will reduce the abilities of individual governments to conserve their environmental resources, whereas it will increase the flow of information to all stakeholders.
- Most solutions to biodiversity problems will be site-specific and local in application.
- Solutions developed for boreal and temperate forests may not be applicable to tropical countries. Similarly, solutions developed for advanced economies may be inappropriate for countries with less developed economies.
- Conventional economics does not adequately address all the issues associated with the conservation of biodiversity.

Forests as source of raw materials

An important aspect of new developments in forestry is the creation of appropriate markets for recreational and environmental goods and services. This is the subject of a major European research project that is currently underway. A considerable amount of further research is required to examine what services people are prepared to pay for and why. For example, in the US National Forests, visitors are now charged if they wish to stop their car in the forests. Charging for access to forests in Germany, on the other hand, is not considered as a realistic proposition. A number of new markets are emerging for wood products. The chemical industry is one such market, thanks to technological developments in the wood-pulping pro-

cess, and in cellulose etherification and esterification. A number of new products are emerging in the field of water-soluble and organosoluble cellulose derivatives as well as regenerated cellulose. Forest owners need to be made aware of the markets that are open to them and of the new instruments that are emerging. For instance, how many forest owners are aware of the potential financing being developed under the Kyoto Protocol?

A number of trends can be identified under the theme of forests as a source of raw materials. The global outlook for the World's forests is for:

- a rising demand for wood and its products
- a declining area of forests available for wood supply
- an increasing pressure on wood supply
- an increasing opportunity and need to restore deforested and degraded land.

Several mechanisms exist to meet these trends, including strengthened inter-sectoral decision making on land use, enhanced forest management and plantation establishment, and specific attention to local fuel shortages.

Recent developments

A number of important developments have occurred since the 1992 World Conference on Environment and Development in Rio de Janeiro. However, progress over forests has been very slow. The Intergovernmental Panel on Forests made many recommendations, few of which have been fully implemented. Its successor, the Intergovernmental Forum on Forests, is still discussing issues, but agreement has not been reached over its primary goal, the establishment of a global forest convention. Similarly, particularly in developing countries there is still more room for implementation very little agreement has been reached over the identification of criteria and indicators for sustainable forest management at the local management unit level, although there have been a number of regional and national processes that have tried to achieve this. Partly as a result of the lack of agreement, many different certification approaches have emerged, resulting in the confusion and frustration of both wood suppliers and wood consumers. Con-

sequently, there is a need for greater harmonisation and mutual acknowledgement of some minimum standards. This should be associated with streamlining and harmonisation of other data collection requirements to minimise duplication of effort.

Progress has been made to establish national forestry programmes, national forest policies and laws, to increase awareness of forest functions and in the signature and ratification of conventions. However, these mean relatively little so long as there is a lack of implementation. This also applies to sustainable forest management: while a lot is known about it, there has been a lack of application. This knowledge and experience should enable the community concerned with forests to provide feedback and advice to policy makers concerning the need to adjust policy: this has rarely happened. The basic fact remains that unsustainable timber production is more profitable in the short-term than sustainable forest management.

A number of needs can be identified, including:

- good governance;
- integrated legislation (both national and regional);
- comprehensive development strategies;
- integrated land use planning;
- stakeholder access and participation;
- multi-sectoral concepts;
- integrated programmes; and
- integrated ecosystem management

In addition, forest policy needs to be strengthened by:

- incentives for sustainable forest management;
- gradual improvements;
- codes of practice;
- bottom-up processes; and
- national consultations.

Research could play an important role in resolving many of the problems associated with forestry. Examples exist in Latin America where research, education and extension activities have been successful in encouraging sustainable forest management. The successful approach has involved determining the community needs first, then seeing how forests can fit into these needs. Important lessons have been learned,

including the need for continuity over time to build on human development, the need to consider community organisation and self-reliance as an objective rather than as an input, and the need to identify the specific interests and demands of different stakeholders. Through such projects, research institutions such as the Tropical Agricultural Research and Higher Education Centre (CATIE) in Costa Rica are setting examples that research institutions throughout the world could usefully emulate.

Particular emphasis was given to the need to integrate research, education and the needs of society. There is an urgent need to transfer knowledge to different user needs, and ensure adequate transfer of knowledge to end-users through training of policy makers, training of technicians and training of local communities. In this respect, forest education cannot be dealt with alone. Rather, it needs to be integrated into general education, with the overall aim being to alleviate the problems faced by local communities. Managerial and participatory capabilities require strengthening before this objective can be achieved.

Other issues raised during or following the keynote presentations included the comparison of public versus private management of forests, the importance of capacity building through education, eco-tourism in forests and concerns about public access to private forests, particularly in Germany.

The role of the media in environmental communication

The condition of the forests of the world is determined by human actions. The media plays an important role in influencing these actions. However, the role of the media is unclear. Many of those involved with forests see the media as a means by which they can communicate their ideas and the results of their actions to a wider audience. The media themselves do not necessarily agree with this role. Consequently, the media does not carry some stories, and the emphasis of others is changed.

The media carry an important responsibility for the transfer of knowl-

edge and ideas to their readers. They are responsible to their readers, listeners and viewers to ensure that the information that they convey is accurate. There is a fine line between journalists and lobbyists, with journalists being expected to provide a clear and balanced exposition of a particular theme.

Perceptions in the media of foresters and the forestry administrations vary between countries. Generally, individuals are viewed as being "good" whereas administrations are viewed as "bad". Such distinctions between individual people and faceless institutions are common, and not restricted to the debate about forests.

Media coverage reflects the interests of the readers. An analysis of recent reports reveals that species protection and nature conservation receive the most attention, followed by tropical forests, hunting, forest fires and forest dieback. This indicates the current preference for stories about animals, exotic topics and disasters. However, media coverage can also reflect the importance of investigative journalism, and examples were provided of the importance of this tool in exposing problems in Romania and Albania.

Forestry administrations have been slow to take advantage of media that they can control. The Internet is a classic example, and it is interesting that some of the best sites about forestry are actually prepared by nature conservation organisations. The Internet is likely to grow in importance, especially as a source of material for journalists and teachers. Teachers already see it as a good way to reach young people, but forestry administrations have still to realise its potential. Examples of where the Internet has been successfully used to disseminate information about forest administration include British Columbia, Canada (<http://www.for.gov.bc.ca>) and Bavaria, Germany (<http://www.forst.bayern.de/>).

There is a need (particularly amongst foresters) to develop an understanding of how the media works. It is not enough to issue a press release and wait for it to be published. A much greater interactive role is required between foresters and journalists: foresters must learn to "sell" their stories in the face of major competition from other interests.

There was a general wish for the media to treat issues fairly and for material to be factually correct.

Methods to raise public awareness and strategies to strengthen public participation in forest issues

Public participation represents a major issue for forestry and sustainable forest management. Three of the previous fora specifically mentioned public participation and stressed its necessity. The importance of public participation in decision-making as it affects the environment has also been stressed in the Aarhus Declaration (available at <http://www.mem.dk/aarhus-conference/declarationf.htm>). Many different types of participation exist, ranging from manipulative to functional, and it is important that participation is genuine. Various requirements exist for effective participation, including a clear mandate, openness of the results, knowledge and learning, feedback, sufficient time, equal rights and responsibilities, and rationality.

As forest policy changes, there is a need to obtain participation from much larger group of stakeholders than at present. Foresters need to be ready to work with other disciplines, particularly those in the social sciences.

In some countries, the image of foresters is changing. This is the case in, for example, Poland. Here, there has been a shift in public opinion, and foresters are no longer seen as tree cutters – instead they are seen as tree growers.

CATIE, in Costa Rica, has been successful in communicating the results of research and development to a range of different stakeholders. One effective means of communication is to use IPS communication channels. A user-friendly presentation can be obtained at low cost but with very effective dissemination. However, the investment requires monitoring and continuity over time.

In Russia, various steps have been taken to increase public participation, but the effectiveness of these steps is uncertain. It is only in the Far East that adequate public participation has been effectively written into the Forest Code.

The role of indigenous peoples should not be under-estimated. Indigenous peoples often have a number of cultural and religious values. If they are given the opportunity to realise these in the forest, their participation in more general issues affecting the forest will be much greater.

Conclusions and recommendations

A number of needs can be identified:

■ Integrated management of natural resources

Forests need to be managed as a part of the environmental and human resources of a country. It is impossible to manage forests sustainably outside this context. Forests are the primary livelihood and sources of income for hundreds of millions of people, and this must be considered when developing and conservation and management plans for forests. Many policies applied to particular sectors have unintended consequences for forests; all policies need to be assessed within an inter-sectoral context prior to application. We know about many linkages: for example between forests and water quality or between forests and people), and we need to better understand these inter-dependencies when take decisions about one component.

■ Valuation of forest benefits

Our current mechanisms for valuing forests are inadequate. The market mechanisms that we have, largely based on traditional economics, do not reflect the ecological and social values of the world's forests. We urgently need to develop funding mechanisms for sustainable forest management. This needs to be based on the adequate valuation of all forest functions and the development of suitable market mechanisms for these.

■ Partnerships and co-operation

We need to build many more partnerships than hitherto. Foresters must join up with those from the ecological, economic and social sciences to provide integrated solutions to problems. Forest managers must form partnerships with all their stakeholders, and must develop forest plans together with those stakeholders. Countries must form part-

nerships to solve transboundary issues associated with forests. Managers, scientists and society in general must form partnerships to better ensure the sustainable management of the World's forests.

■ Education

Major changes are needed in the way that we approach education. First of all, we must try and attract the best students to take on the challenges presented by sustainable forest management. Secondly, we must ensure that all disciplines involved in forests provide sufficient information about the context of those forests within the broad field of sustainable development. Thirdly, we need to ensure that extension and outreach is conducted – science must make help to solve the problems that we face. Fourthly, those involved in education need to develop their own experience, particularly in relation to identifying the real needs and priorities of society.

■ Coherent government policy and actions

Related to the first conclusion, government policy must integrate resource management much better. A balance between public and private interests has to be sought. The priority of many developing countries is poverty alleviation. Forests can play a role in helping to resolve this problem. The forest community also has a major role to play in supplying feedback to policy makers about where current policy is creating problems or failing. Without this information, policy makers are unable to make the necessary adjustments to rectify the situation. Good governance is an essential prerequisite for sustainable development: it must be based on democracy, equity, gender equality, transparency, conservation and sustainability.

■ Greater stakeholder involvement

Many forms of participation exist, but some of these do not represent genuine participation. Too often, a policy is decided behind closed doors then taken to a select group of stakeholders for discussion. This results in dissatisfaction, frustration and inappropriate policies and management. Mechanisms need to be developed to improve stakeholder access to discussions and decision-making about forests and forest landscapes. This is particularly true in those

countries where, for historical reasons, some stakeholders have previously not had such access. Those responsible for ensuring wider stakeholder involvement must be aware of the multitude of factors that can inhibit genuine stakeholder participation.

■ Accurate monitoring and statistics

Policies and management are best developed on the basis of good information. This information is often poor or unavailable within the context of forests. Steps need to be taken to ensure the better collection, analysis and publication of global data related to forests. While progress has been made in this field, much remains to be done. International organisations have a role to play here, but great care should be taken to ensure that bureaucratic issues do not hinder the advancement of this important area.

■ Sustainable forest management

The overall goal to which those concerned with forests are working is sustainable forest management. This cannot be seen in isolation – it must be seen together with issues such as poverty alleviation and the reduction of hunger. With the demand for wood increasing, and the available wood supply decreasing, major steps are urgently required to ensure that the demands for wood today and in the future are met. This must be done within the context of sustainable development, and we must ensure that all the benefits from forests, including both timber and non-timber benefits, are distributed in an equitable and sustainable way.

Overall, a single theme has emerged from the fora. The physical, biological, economic and social environments of forests are changing, and society is not yet ready to meet these changes. Consequently, we are faced with a major challenge that will require us all to work together in solving.

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Congress Programme

Friday, 26 November 1999

Forstmann, Klaus-Dieter
Vollmer, Udo

Falkenberg, Claus-Michael
Michaelowa, Axel
Hinz, Burkhardt

Gößling, Stefan

Opening Address

Opening of the Round Table: Funding within the Framework of International Processes Aiming at the Conservation and Development of the World's Forests
GTZ Sectoral Project 'Support to International Programmes in Tropical Forestry',
The Role of Forestry in the Flexible Mechanisms of the Kyoto Protocol
Financial Co-operation with Developing Countries:
Resource Conservation Projects
Communicating, Financing, and Preserving Forests –
Blueprint for an Integrated Conservation Strategy

Saturday, 27 November 1999

Schreiner, Johann
Greifelt, Werner
Gottlob, Thomas
Salleh, M.N.
Ramani, K.V.
Ruhl, Matthias
John Joseph, S.
Mantau, Udo

Rollinson, Tim
Weber, Gunter

Killmann, Wulf
Ammour, Tania

Opening Address

Welcoming Address on behalf of the Minister of Lower Saxony, Mr. Uwe Bartels
Welcoming Address on behalf of the Federal Minister, Mr. Karl-Heinz Funke
Humankind in Nature
Forestry and Energy: Review of Issues and Policies
Biomass for Energy – The Actual Point of View of PreussenElektra AG
Biodiversity in Forests – A Treasure of Ecological and Human Communities
Risks and Chances to Market Recreational and Environmental Goods and Services – Experiences from a Hundred Case Studies
Forests as Source of Raw Materials
Wood as a Natural Resource – Innovative Design for Chemical Products as a Contribution to Sustainable Development
Forestry at the Millennium – Challenges Ahead
Educational and Outreach Programmes: Experiences from Central America

Sunday, 28 November 1999

Innes, John

Cerovský, Jan
Griesel, Frank
Kürsten, Ernst
Mato, Xhemal
Stoica, Dan

Opening of the Podium Discussion:

The Role of the Media in Environmental Communication
The Debate on Sustainable Forestry in the Media of the Czech Republic
The Dog Attends to his Master, not the Other Way Around
The Image of German Forestry on the Internet
The Image of Albanian Forests in TV and Newspapers from 1991 to 1998
The Image of Forests in Romanian Media During the Transition Period to Market Economy

Innes, John

Brüggemann, Jens
Pretzsch, Jürgen

Pudlis, Eugeniusz
Ammour, Tania

Teplyakov, Victor K.

Opening of the Podium Discussion: Methods to Raise Public Awareness and Strategies to Strengthen Public Participation in Forest Issues

Pro Public Participation: Potentials and Pitfalls
Forestry between Participation and State Management. Case Studies from Mexico, Guatemala, India. Results and Outlook
The New Image of Polish Foresters
Examples of Effective Ways to Raise Public Awareness in the Forests and Society Interface
Creating a Framework for Public Involvement in Forest Management Decision Making in Russia

Eröffnung des FachForums „Wald und Gesellschaft“ am 27.11.1999 in Soltau

Johann Schreiner

Sehr geehrte Abgeordnete des Deutschen Bundestages, sehr geehrte Abgeordnete des Niedersächsischen Landtages, sehr geehrter Herr Staatssekretär, sehr geehrte Frau Regierungspräsidentin,

ich darf Sie im Namen der Alfred Toepfer Akademie für Naturschutz ganz herzlich zum FachForum „Wald und Gesellschaft“ begrüßen. Es ist dies die fünfte und zugleich letzte Konferenz einer Reihe, die das Thema Wald in den Mittelpunkt der Überlegungen an der Schwelle zum 21. Jahrhundert stellt.

Das Motto Mensch – Natur – Technik der EXPO 2000 in Hannover spiegelt sich in den Themen unserer Konferenzreihe wider:

- Energiepotential Wald
- Biodiversität – Schätze in den Wäldern der Erde
- Rohstoffquelle Wald
- Wald und Atmosphäre-Wasser-Boden

Und heute das Thema „Wald und Gesellschaft“ beleuchtet Zukunftsfragen der Menschheit.

Ich bin sehr froh, dass Herr Karl-Heinz Funke, Bundesminister für Ernährung, Landwirtschaft und Forsten, noch in seiner Amtszeit als Niedersächsischer Minister für diesen Bereich die Schirm-

herrschaft für die FachForen-Reihe übernommen hat.

Nachdem große Ereignisse in Hannover ihren Schatten bis nach Soltau werfen begrüße ich heute in Vertretung von Herrn Minister Bartels Herrn Staatssekretär Greifelt, verbunden mit dem Dank für die stetige Unterstützung der FachForen, auch als Mitveranstalter. Das Bundesministerium für Ernährung, Landwirtschaft und Forsten wird heute durch Herrn Thomas Gottlob vertreten.

Die Mitglieder des International Advisory Board bürgen für die fachliche Qualität und die Internationalität der Foren. Ich begrüße Herrn Dato Dr. Salleh aus Malaysia und Herrn Dr. Wulf Killmann von der FAO aus Rom. Ich begrüße die anwesenden Mitglieder der Steuerungsgruppe, die in mehreren Sitzungen das Programm dieser Veranstaltung aus der Taufe gehoben haben.

Diese Konferenz wäre nicht möglich gewesen, wenn sich nicht eine ganze Reihe von Institutionen als Förderer beteiligt hätten:

- Deutsche Bundesstiftung Umwelt
- Bundesministerium für Ernährung, Landwirtschaft und Forsten
- Niedersächsische Umweltstiftung
- Niedersächsische Lottostiftung
- EXPO-GmbH
- Alfred Toepfer Stiftung F.V.S.

- Verein der Förderer und Freund der Alfred Toepfer Akademie für Naturschutz e.V.
- Landkreis Soltau-Fallingbostal
- Stadtwerke Schneverdingen
- Firma Grube KG
- Brauhaus Johann Albrecht.

Last, but not least tragen natürlich die Referentinnen und Referenten, die Vorsitzenden der einzelnen Abschnitte und Sie meine sehr verehrten Damen und Herren zum Gelingen der Konferenz bei. Teilnehmerinnen und Teilnehmer aus 19 Staaten, die heute hier versammelt sind, bürgen für die nötige Internationalität.

Wir von der Alfred Toepfer Akademie für Naturschutz tun unser Möglichstes, um die Ergebnisse der Öffentlichkeit zur Verfügung zu stellen, sie in die EXPO 2000 einzubringen und in internationale Gremien einzuspeisen. Alle Ergebnisse der Konferenzen werden als Sonderhefte der Berichte der Akademie bis zum nächsten Frühjahr publiziert. Das erste Heft liegt druckfrisch vor und es ist mir eine Freude, dieses Herrn Staatssekretär Greifelt überreichen zu dürfen.

Ich wünsche uns eine erfolgreiche Konferenz und gute Ergebnisse, die etwas zum Wohle der Wälder und der von Ihnen direkt und indirekt abhängigen Menschen bewegen.

Anschrift des Verfassers:

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Grußwort des Herrn Ministers Uwe Bartels

übermittelt von Herrn Staatssekretär Werner Greifelt

Meine sehr geehrten Damen und Herren,

es ist mir eine besondere Freude, eine so zahlreiche und internationale Teilnehmerschaft hier in Soltau begrü-

ßen zu können. Das Thema des FachForums „Wald und Gesellschaft“ ist in seiner Komplexität hervorragend geeignet, die Ergebnisse der bisherigen FachForen des Weltforum Wald zur Rohstoff- und Energiereisourcenfunktion sowie zur

Biodiversität der Wälder zusammenzufassen.

Die Ansprüche der Gesellschaft an den Wald sind im globalen Rahmen so vielfältig und unterschiedlich wie die zahlreichen Wald- und Gesellschaftsformen der Welt.

Aber selbst im nationalen Rahmen existieren zahlreiche verschiedenartige, zum Teil gegenläufige Erwartungen an den Wald.

Meine sehr geehrten Damen und Herren,

gestatten Sie daher, dass ich mich auf die Verhältnisse meines Heimatlandes konzentriere. Der Wald in Deutschland erschien zu Beginn der menschlichen Siedlungstätigkeit eine unerschöpfliche Rohstoffquelle zu sein. Holz stand wie heute noch in vielen Ländern der Erde als einziger Brennstoff zum Heizen und Kochen zur Verfügung. Später wurde es für den Betrieb von Bergwerken und als wichtigster Baustoff für Häuser und zahlreiche Gegenstände des täglichen Gebrauchs. Im Wald wurden Schweine, Rinder und Ziegen gemästet. Der Siedlungsraum und die landwirtschaftlichen Flächen wurden dem Wald durch Rodung abgetrotzt.

All dies führte bereits um 1300 zu Waldverwüstungen und zu einem Mangel des Rohstoffes Holz. Dieser Zustand verschärfte sich im Laufe der Jahrhunderte. Die Pestzüge in Mitteleuropa und später der 30-jährige Krieg brachten jeweils nur kurzfristige Entspannungen für den Wald. Anfang des 19. Jahrhunderts waren nur noch klägliche Reste des einstmals fast das ganze Land bedeckenden Waldes vorhanden.

Selbst drakonische Strafen auf sogenannten Holzfrevell, also auf die Waldvernichtung, wie sie durchgängig in den Holzordnungen seit dem 14. Jahrhundert enthalten sind, konnten diese Entwicklung nicht aufhalten. Erst die rasant entwickelte Entwicklung der Landwirtschaft in Folge der Mineraldüngung und das Aufkommen der Braun- und Steinkohle als Hauptenergieressource im 19. Jahrhundert schafften den nötigen gesellschaftlichen und volkswirtschaftlichen Spielraum, in dem die aufkommenden Forstwissenschaft den Begriff der Nachhaltigkeit definieren und der Wiederaufbau der Wälder durch Aufforstungen in Angriff genommen werden konnte.

Bei den Wiederaufforstungen sind durch unsere Vorfahren außerordentliche Leistungen erbracht worden. Rund 1/3 Deutschlands sind wieder mit Wald bedeckt. Die meisten Wälder sind soweit regeneriert, dass naturnahe Waldbehandlungsmethoden, die auf standortgerechte, strukturreiche Mischwälder abzielen, eingeführt werden konnten. Mit einem Wort, der Wald in Deutschland ist wieder etwas selbstverständlich Vorhandenes.

Meine sehr geehrten Damen und Herren,

damit wieder zurück zu den gesellschaftlichen Ansprüchen an den Wald in Deutschland. In der Vergangenheit – und dies galt bis in die 50er und 60er Jahre unseres Jahrhunderts – diente der Wald hauptsächlich der Holzproduktion. Im Bewußtsein der Menschen – geprägt durch Holznot und in den Nachkriegszeiten durch Reparation und Wiederaufbau – war diese Funktion des Waldes positiv belegt und wurde nicht in Frage gestellt.

Selbst die Verklärung des Waldes, wie sie sich seit der Romantik in der Kultur manifestierte, stand nicht im Widerspruch zu den profanen Nutzungsansprüchen der Menschen. Die Waldeigentümer, und dies gilt auch für die staatlichen, konnten „ihren“ Wald so gestalten, wie es ihnen angemessen erschien. Diese „Eigentumsentscheidung“ schloß auch ohne den heutigen gesellschaftlichen Druck bereits in vielen Fällen Aspekte des Naturschutzes und anderer Schutzfunktionen ein. Dies ist mit ein Grund dafür, dass heute der Wald in Deutschland das naturnahste Ökosystem im Vergleich der verschiedenen Landnutzungsformen ist und zahlreiche Wälder einen besonders hohen Naturschutzwert besitzen.

Vor rund 30 Jahren setzte der Umbruch ein. Es wurde unter anderem der Umweltschutz geboren. Das Jahr 1970 wurde zum ersten europäischen Naturschutzjahr erklärt. Zahlreiche rechtliche Regelungen für den Umweltschutzbereich sind in der Folge entstanden.

Ende der 70er Jahre kam initiiert von dem Göttinger Forstbodenkundler Prof. Dr. Ulrich die Diskussion um die Waldschäden auf. Der Wald erfuhr damit ein verstärktes umweltpolitisches, gesellschaftliches Interesse.

Dass diese Entwicklung nicht auf Deutschland beschränkt blieb, verdeutlichen die in Rio 1992 eingeleitete Agenda 21 sowie auf europäischer Ebene die Ministerkonferenz zum Schutz der Wälder 1993 in Helsinki und deren Folgekonferenzen.

Der Wald steht damit global, aber insbesondere auch in Deutschland, im zentralen Interesse der Öffentlichkeit und zahlreicher Verbände.

Meine sehr geehrten Damen und Herren,

dies kann einerseits als Problem aufgefaßt werden, insbesondere, wenn einzelne Interessenverbände Vorgaben für die Waldbehandlung ohne Beteiligung der Eigentümer durchsetzen wol-

len – ja in Einzelfällen sie nur als Hindernis bei der Umsetzung hehrer, idealer Ziele zu betrachten.

Andererseits kann es als Chance verstanden werden, in einem offenen Dialog einen sinnvollen Konsens der differierenden Ansprüche an den Wald zu erreichen, ohne Eigentümerinteressen zu verletzen.

Möglich ist dies aber nur, wenn der Dialog von allen Beteiligten sachlich und fair geführt wird. Hier sehe ich zur Zeit insbesondere im Bezug auf die Sachlichkeit einige Probleme in Deutschland.

Viele Menschen haben durch den Verlust ländlicher Mentalität und Lebensform, naturfern in den Städten wohnend, eine massive Sehnsucht nach der angeblich ehemals so heilen Natur. Sie wird für paradiesisch verklärt und stellt quasi eine Ersatzgottheit dar, die sich ohne den Störfaktor Mensch von selbst als harmonisch Ganzes selbständig entwickelt.

Die Menschen sind von den natürlichen Lebensabläufen derart entfremdet, dass das Kälbchen auf der Weide niedlich und das daraus produzierte Geschnetzelte ein weiter zu empfehlender Geheimtipp ist. Der dazugehörige Schlachter und der Schlachthof werden aber geradezu als verabscheuungswürdig angesehen.

Gleiches gilt für den Wald. Die modernen erfolgreichen und ökologisch orientierten Bürger unseres Landes wohnen gerne in Holzhäusern oder zumindest mit Vollholzmöbeln ausgestatteten Häusern. Dennoch ist der Wald für sie aber ein unantastbares „Naturerbe“, dass vor den Menschen, denen er gehört bzw. die ihn nutzen wollen, geschützt werden muß.

Dies, meine sehr geehrten Damen und Herren,

kann nicht die Grundlage eines sachlichen und fairen Dialogs sein. Großflächige Totalreservate oder Prozeßschutz auf der einen Seite und rein auf der Holzproduktion ausgerichtete Forstwirtschaft auf der anderen Seite sind weder für Mitteleuropa noch für andere Regionen der Welt zielführend und zukunftsfähig.

Denn hier wie dort gilt auf lange Sicht der bewährte Ansatz für den Erhalt der Wälder „use it or loose it – nutz es oder verlier es“.

Das in Mitteleuropa vorhandene Leitbild einer multifunktionalen Forstwirtschaft, Kulturfunktion des Waldes

zur Deckung bringt, kann hier als richtungsweisend angesehen werden. Der Vorrang einzelner Funktionen auf bestimmten Flächen wird dadurch nicht ausgeschlossen.

In Niedersachsen findet dies zum einen seinen Ausdruck in einem mit der Naturschutzverwaltung abgestimmten Waldschutzgebietskonzept, das auf rund 27% des Waldes, der im Besitz des Landes ist, dem Naturschutz – in unterschiedlicher Intensität bis zum totalen Nutzungsverzicht – den Vorrang einräumt.

Zum anderen wird im gesamten niedersächsischen Landeswald durch das 1991 beschlossene Programm der Landesregierung zur langfristigen ökologischen Waldentwicklung in den Landesforsten – kurz LÖWE – die Berücksichtigung von Naturschutzaspekten sichergestellt.

Bei der Abwägung der Ansprüche der Gesellschaft muß aber für den nicht staatlichen Wald eine eindeutig klargestellte werden.

Über die ordnungsgemäße Forstwirtschaft und die Sozialpflichtigkeit (Art. 14 Grundgesetz) hinausgehende Infrastrukturleistungen, sei es für den Naturschutz oder andere, können nur gefordert werden, wenn die Gesellschaft oder die jeweiligen Interessenten bereit sind, die damit verbundenen finanziellen Nachteile zu entschädigen.

In der Öffentlichkeit wird von einzelnen Interessenvertretern der Eindruck erweckt, dass die Sozialpflichtigkeit des Eigentums an dem natürlichen Ökosystem Wald jegliche Auflagen und Forde-

rungen abzudecken hat. Dieses ist weder rechtlich zutreffend noch akzeptabel. Nur wenn auch die berechtigten, originären Interessen der Waldeigentümer berücksichtigt werden, dient dies langfristig dem Erhalt des Waldes und der Sicherung seiner vielfältigen Funktionen.

Meine sehr geehrten Damen und Herren,

ich habe in meinem Grußwort sehr viel über Probleme geredet. Ich bin allerdings der Meinung, dass einige klärende Worte bei den z.T. sehr divergierenden Ansprüchen der Gesellschaft bzw. Teilen derselben an den Wald bei einem FachForum mit der Thematik „Wald und Gesellschaft“ angebracht sind.

Für den erfolgreichen Abgleich der Ansprüche der Gesellschaft an den Wald gibt es auch sehr positive Entwicklungen.

Anfang der 80er wurde versucht, durch Boykott von Tropenholz die Vernichtung der Regenwälder zu stoppen. Dass dies zu keinem Erfolg führte, wurde durch zahlreiche neue Rinderfarmen und Ölpalplantagen auf ehemaligen Waldflächen schnell deutlich. Der bereits einmal zitierte Ansatz zum Erhalt der Wälder – „use it or loose it“ – war geboren.

Mittel für eine sinnvolle, naturverträgliche Nutzung der Wälder sollte eine Zertifizierung des dort produzierten Holzes sein.

Dass die Einführung einer derartigen Zertifizierung auch nicht unproblematisch ist, zeigte sich bei der Diskussion der verschiedenen Systeme in Europa in den letzten Jahren.

Es freut mich daher sehr, Ihnen mitteilen zu können, dass das Land Niedersachsen sich der Pan-Europäischen-Forstzertifizierung (PEFC) anschließt und voraussichtlich bereits zum Anfang des nächsten Jahres Holz aus Niedersachsen PEFC zertifiziert sein wird.

Der Leitspruch des PEFC ist: „Verwende Holz und du trägst zur nachhaltigen Bewirtschaftung von Europas wichtigstem Ökosystem – seinen Wäldern – bei!“

Ich bin der festen Überzeugung, dass die vielfältigen Funktionen und Leistungen unserer Wälder auch für nachkommende Generationen erhalten werden können. Wir müssen nur miteinander reden und auf die Nachhaltigkeit ausgerichtete Ziele und Grundsätze für die Behandlung unserer Wälder vereinbaren. Dabei sollten allerdings nicht einzelne Interessengruppen versuchen, ihre Position ohne Rücksicht auf andere durchzusetzen.

Ich bin sicher, dass dies möglich ist und dieses FachForum zu einem zukunftsweisenden, sachlichen Dialog beiträgt.

Ich wünsche Ihnen für diese Tagung viel Erfolg und, soweit Sie aus fernen Ländern angereist sind, einige positive und erlebnisreiche Tage in meinem Heimatland.

Anschrift des Verfassers:

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Welcoming Address on behalf of the Federal Minister, Mr. Karl-Heinz Funke

Thomas Gottlob

Ladies and Gentlemen,

I wish to convey to you the best regards of Federal Minister Funke who has assumed the patronage over the entire series of events. I am pleased that you have accepted the invitation to the fifth and last Forum on “Forests and Society” in such large numbers.

With the key topic “Man-Nature-Technology”, the world exhibition EXPO 2000 provides an ideal platform to focus the public's attention to our forests as well as to the prominent role forests play for life on earth and the environment. The EXPO project “World Forum Forest” has adopted this objective in an exemplary way.

Within the framework of this series of meetings with international participation practice-oriented recommendations are worked out for the sound management of forests. They will support the implementation of guidelines for sustainable forest management as well as activities in the Agenda 21 process relating to forests.

The major issue of the fifth and concluding forum within the framework of the overall project is “Forests and Society”. This title underlines the importance of the relations between population, forests and forestry as well as the socio-economic aspects of sustainable forest management. The development of for-

ests and society cannot be seen in an isolated way. The diverse interactions between forestry and society have to be taken into consideration if drawing up concepts. The different rights to use of man and the necessary land areas for forest development must be reconciled with one another.

In the next two days you will hold intensive technical discussions on concepts relating to future demands on forest products and services rendered by forests on the basis of the results which the fora have so far achieved.

You will then discuss possibilities for a greater participation of relevant interest groups in decision-making and implementation processes if drawing up recommendations for action for sustainable development.

Ladies and Gentlemen,

The term "sustainable development" leads us back to the year 1992 when the Conference of Rio de Janeiro was held. Here the states of the globe showed their willingness to address central future tasks of mankind and seek jointly for solutions to global environmental issues. We all remember that a vision came from this conference – the vision of sustainable development.

Rio has been a sign of hope for many people on this planet.

Today, we must realise that this vision has not yet been filled with so much life as had been hoped for by many of them.

On the threshold to the next millennium the following questions arise: Where do we stand today? How is the global ecological assessment? How are environment and development reconciled with one another?

The global environmental trends confront us with harsh reality.

Forest losses – 12.5 million hectares got lost every year in the tropics alone between 1990 and 1995 –, the progressive spread of deserts, the shortage of drinking water resources and global warming continue in an undiminished way.

These developments affect the lifeblood of mankind.

Against this background the question arises: What tangible progress have we achieved since Rio to protect our natural resources at the global level?

The report of the United Nations Environment Programme gives us a plain answer. It states that despite continuous efforts and initiatives we did not achieve our goals.

Undoubtedly, there are also positive developments such as in the field of ozone layer protection. Quite a lot has been achieved in the climate negotiations in the last few years. Good progress has also been made by many states in air pollution control and water conservation.

But this progress in some sectors is offset rapidly by an increase in pressures elsewhere which are also due to the rapid population growth.

The forest ecosystems are particularly affected by this phenomenon.

For this reason it is of decisive importance to develop holistic approaches and recommendations for action which help meet the conflicting interests concerning the forest. In the process special focal points must be more effective forms of communication, participation and integration to solve conflicts of interests.

In the next two days you will discuss, inter alia, possibilities for a greater participation of relevant interest groups in decision-making and implementation processes if drawing up recommendations for action for sustainable development.

Discussions will focus on finding suitable problem solving strategies for the manifold and diverse conflicts of interests in the forest sector. In view of the growing demands on forest products and services rendered by forests and the developments which seem hardly controllable such as globalisation and urbanization as well as a change in values which can be described by the keywords levelling down and individualisation, the search for new ideas, structures and approaches is indispensable to increase the effectiveness in solving problems.

In this connections the forest decisions of Rio and the proposals for action of the Intergovernmental Panel on Forests (IPPF) provide an important consensus at international level. With this triad of management, conservation and sustainable development a foundation was laid for a new global policy relating to forests and their contribution to sus-

tainable development. The 1997 Special Session of the United Nations General Assembly recommended that "National forestry programmes" be worked out for the practical implementation of these principles and for a dialogue with the public.

The Federal Ministry of Food, Agriculture and Forestry has adopted this instrument to analyse for Germany the environment-related, social and economic values of the forest on the basis of national priorities, strategies and measures for sustainable development.

At present, a "National Forestry Programme for Germany" is drawn up in a multidisciplinary dialogue with the broad participation and involvement of all interested and relevant groups. Main elements of this "National Forestry Programme for Germany" are an intersectoral approach and the involvement of all groups interested in forest policy discussions. The National Forestry Programme should become a process full of life through transparency and openness.

In this connection, the results of the Forum "Forests and Society" are of special importance, as they will leave their mark on the ongoing process of drawing up a "National Forestry Programme for Germany".

I believe that this Forum will succeed in developing perspectives on how to speed up the sustainable development of forests at the global and local levels in a democratic discourse.

I wish this meeting every success, fruitful discussions and results which are decisive for the future.

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Key-notes

Humankind in Nature: A Quick Revisit

M.N. Salleh

1. Introduction:

It is a real paradox. Humankind started living with nature, intimate and close, a relationship that involves all aspects of Humankind's survival. Then he discovered fire, then he made weapons, he then practised agriculture, then developed industries, and now Humankind thinks he is as good as Nature. However, as Humankind "progresses" through time and now reaches a stage of "arrogance" with respect to Nature, he suddenly realises that he cannot do without Nature. Thus, he "repents", and now looks upon Nature as his "partner" on Earth, one that he cannot do without and one that he must respect. That was how Humankind first started on earth!

2. Awareness

This awareness of Nature and the environment has never been as great as it is now. The United Nations Conference on Environment and Development (UNCED) in 1992 was the ultimate in that expression of awareness at the highest political level. At the lowest level of society, is the individual who has in general been made aware of his environment through technological developments such as the great strides of information technology. Television such as National Geographic now brings the intricacies of nature to the living room. Everyone is now "green". Society, at all levels, are very aware of the need to be in harmony with Nature.

3. Nature and Forestry

While there is more to Nature than just forests, foresters can be justified if he is arrogant and considers forests as the "center" of the Universe of Nature. The justifications are obvious if we consider the roles and functions of forest globally compared to other types of Nature. However, while the forestry profession is by definition a "green" profes-

sion, the forester has somehow been marginalised in the global debate and in the global awareness of Nature. This is in part due to the image of the forester being a "destroyer" of forests and partly due to foresters being too involved with the "trees" that he did not see the "forests". Foresters had failed to realise, until recently, that forests are more than a provider of timber and a provider of raw materials to Humankind. However, the pressure of Humankind in the form of the consumer is now forcing foresters and the forestry profession to rethink his role and to restructure his profession.

4. New Challenges

The forestry profession is now being faced with new challenges that were not taught when the current professionals were at school. Forestry is now called upon to save mother Earth. That is the basic challenge of the profession. The conservation of biodiversity, saving endangered species of fauna and flora, sequestration of global carbon, providing adequate clean water, recreation, and urban parks, rehabilitate degraded lands and to "green" the deserts, are new challenges. To make it more challenging, the forester must provide all these to an increasing population and a reducing available land area, with the exception of degraded lands and deserts. These will be elaborated in another paper later by Dr. Wulf Killmann who will discuss the new challenges of forestry in the new millennium.

5. The Forestry Profession

The greatest challenge is in the forestry profession itself. There is an urgent need to enhance the image of the forestry profession. Under the modern environment, the young entering university has numerous choices to make. The best is unlikely to choose forestry as a profession. This is particularly so in the developing countries where the attraction

and glamour of such professions such as medicine, engineering and law, draw the best students to these professions. Under such conditions, there is the real danger that forestry becomes a "residual" profession, manned by genetically mediocre individuals. The phenomenon of genetic erosion may well occur within the forestry profession itself, besides happening within the forests proper. The profession must address this as an urgent issue of concern.

Towards this end the profession must put in place professional registration regulations, codes of professional conduct, professional code of practice, and develop standards that all professionals must adhere to and respect. While some countries already have these, such as in Germany and in many developed countries, in the majority of countries, particularly the developing countries, they are not in place. If foresters are to be respected profession, the professional infrastructure including legislations, must be put in place.

6. Conclusion

There is no doubt that Humankind will depend more and more upon Nature for his continued physical and psychological survival. In this regard, the challenges and opportunities to the forestry profession have never been so great. The move towards greater empowerment, participatory management, privatization and globalization, are new social and economic dimensions to the many new technical challenges faced by the forestry profession. This great affinity of Human in Nature could lead to the downfall and obscurity of the forestry profession if the profession is not collectively pro-active, organized and determined in developing true "professionalism" in the forestry profession.

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Forestry and Energy: Review of Issues and Policies

K. V. Ramani

Abstract

Wood fuels form the main source of energy for the vast majority of rural populations in Asia. They also feature in commercial energy markets in urban areas where people cannot access or afford modern energy alternatives. Studies of overall energy supply and demand trends in the region indicate that wood fuels will continue to play a crucial role in the foreseeable future. In many instances, their absolute consumption will increase due to population pressures and the sluggish pace of increase in modern energy availability.

Opinions differ on the relationship between wood energy and forestry. Conventional wisdom views unsustainable wood fuel consumption as a major cause of deforestation in developing countries. It holds wood energy responsible for a series of adverse environmental impacts, notably in the context of climate change where the depletion of forests is seen as potentially disastrous. The emerging view is that wood fuels are not only produced and consumed in a sustainable manner by and large, but they are also derived mostly from sources other than natural forests. Furthermore, wood fuels provide essential livelihood opportunities for many, especially the poor, and help avoid substantial carbon emissions by replacing fossil fuels. The evidence in balance prompts the encouragement of wood fuels as a practical strategy for the future, both in the rural context to meet basic needs and help reduce poverty, and in urban areas to promote environmentally desirable alternatives to fossil fuels.

Prevailing policies in many Asian developing countries suffer from the common misconception of wood as a primitive source of energy, overlooking important technological options capable of transforming wood fuels into higher and cleaner forms of energy. As a result, a variety of barriers stand in the

way of wood and wood fuel extraction, movement, trade and utilization. Key institutions which can play a more enlightened role in wood energy development lack the necessary awareness and motivation to deviate from their established outlooks. On the whole, the extent of financial, human and technical resources committed to wood energy development does not measure up to ground realities.

Given the higher prices and uncertain supplies of fossil fuels and electricity, the transformation of wood energy to meet rising demand in the future is a crucial concern for Asia. National policies and plans need to recognize the economic, social and environmental advantages of wood energy and act upon them in a manner conducive to the sustainable production and use of wood fuels. Agroforestry, tree plantation, sustainable forest management and technological interventions are among the range of measures which could help realize the full potential of wood energy in the future.

Achieving the necessary policy change is a rather complex affair. In most countries, no single set of policies deals exclusively with wood energy as such. Policies affecting wood energy are more often than not 'derived' as a corollary of other national and sectoral policies. This owes to the nature of the wood energy cycle, which is a diffused process with a wide variety of supply sources, movement and trade modalities, applications and users. The process criss-crosses numerous economic sectors and national development priorities, and it is subject to site-specific variations that could confound simplistic approaches. A broad-based approach, relying on consensus-building and institutional innovation is called for. Simultaneously, there is a need for legal and regulatory reform aimed at liberalizing wood energy markets while preserving essential safeguards against the overexploitation of natural forests. While these measures

obviously need to be propelled by governments, their eventual success would depend on the extent to which private initiative and user communities are empowered to play a decisive role.

Transcript of the presentation by K. V. Ramani based on slides presented and tapes including additional information discussed after the presentation

Responsible editor: Jutta Poker

Introduction

From the energy viewpoint people simply discovered forest or wood energy as something of an issue after the oil price crisis of the 1970s. Before that one did not pay any attention from the energy side. Since then we have come a long way but how far we have come towards sustainability of traditional energy resources of which wood fuels are the main component that remains to be seen.

This paper is based on two main considerations. One is: I see sustainability when it comes to energy not only as an issue of environment and inter-generational equity but in the more immediate context of basic needs and intra-generational equity. We not only need to protect the forests for the future generations or tree resources for the future, we also need to meet the need of the people right here, right now, in the developing countries. Thus, there is occasionally a possibility of a conflict of perceptions and objectives, but this is inevitable.

The second concentration is based on my awareness of issues in the Asia Pacific region. Even though I had the honour of chairing one of the two workshops of the earlier forum on forestry and energy I claim no expertise or mastery over the situation in Africa or Latin America. There are, however, people from those countries right here, so please feel free to bring out any special highlight that is not necessarily consistent with the situation in the Asia Pacific.

Dependence on Wood Energy

Table 1 shows basically the wood energy situation in the Asia Pacific region based on a study by the FAO's Regional Wood Energy Development Program in selected countries.

Tab. 1: Share of wood energy in aggregate consumption

Country	%	Country	%
Bangladesh	17	Maldives	55
Bhutan	86	Myanmar	78
Cambodia	82	Nepal	69
China	12	Pakistan	10
India	21	Philippines	22
Indonesia	38	Sri Lanka	49
Laos	88	Thailand	19
Malaysia	9	Vietnam	52
Average: 47%			

The share of wood energy in the aggregate national energy consumption averages about 47% for these countries. These are probably the countries most heavily dependent on wood energy. The share in aggregate energy consumption includes both rural and urban areas. If you just recognise the fact that in almost all of these countries the rural population averages about 70% of the total and if you just look at the rural energy consumption where the supply of modern energy is much lower than in the urban areas, this average of 47% would be much higher, in fact about 70% of rural energy consumption is based on wood.

Wood Energy Consumption Patterns

There might not be very many dissimilarities in consumption patterns among the developing countries in general, they are pretty much the same around the world:

- 96% of wood energy consumed is fuelwood, the rest is charcoal
- more than 80% of wood fuels are used in household for cooking
- 10 to 30% of wood fuels are used in rural and cottage industries and finally
- in urban areas, wood fuels are used by the poor as primary fuels, although the middle-class even use the wood fuels as a secondary fuel sometimes in preference to kerosene or

when there is a shortage of supply of other options.

These are very broad benchmark considerations when we look at how wood energy is actually used.

Wood Energy Supply Sources

Since data on wood energy supply sources is not available for all countries, Tab. 2 concentrates on 7 countries. Up to 90% of the wood energy is derived from non-forest sources in the case of Indonesia and Pakistan.

Tab. 2. Wood energy supply sources

Country	Forest %	Non-forest %
Bangladesh	16	84
China	41	59
India	42	58
Indonesia	10	90
Pakistan	10	90
Philippines	20	80
Vietnam	34	66

Non-forest sources mostly are agricultural plantations, homesteads, orchards, tree plantations along roadsides and wasteland. These are the majority sources for the energy that is being used.

The Wood Energy Economy

There is a common conception that by and large, most of the wood energy that is used in the developing countries is cost-free, that is does not have a financial price though it may have an economic or environmental price. This is partly true and partly not true:

- Only about 15% of all the wood energy that is used in rural areas, has a price; the rest is not entering into the financial transaction market
- 90-100% of the wood energy in urban areas is traded, almost all is virtually commercialised; it competes with any other fuel like kerosene or electricity.
- Wood fuels are a major source of income for the poor, as much as 80-100% at times like in Myanmar

where in some households the income simply comes from collecting fuelwood and selling it either to the nearby townships or small towns. In these cases, wood energy has more than a consumption objective, it has actually a cash or income generation objective. Since this occurs mostly on the level of the poor, there is a very significant basic needs-relationship here.

- The transition from wood fuels is invariably linked to fossil fuels, i.e. coal, kerosene and LPG (Liquefied Petroleum Gas), since the bulk of wood energy is used for cooking. Cooking fuels are substituted, if you ascend the energy ladder, by more and more advanced forms in those countries where all these options exist. In China, for example, much of the transition from wood fuels has taken place in the form of substitution by coal. In the urban areas LPG is the ultimate cooking fuel.
- Wood energy substitution is income- and price-sensitive, and it is reversible. Because of this very large proportion of wood energy that has no price, any transition first requires some amount of income. In the rural areas people would make a transition from wood to coal or wood to kerosene at a certain point in time when their income can afford it. But because it is also price-sensitive this transition is not necessarily a one way traffic. In Sri Lanka for instance, when the government removed the subsidy on kerosene oil prices there was a reversed transition back to fuelwood. So these are not permanent structures because in the rural areas wood is still available. Even in the urban areas wood is still available, so to the extent that it is a fuel that is available either for collection or for purchase, people can switch back in time when they feel that either the price or the income criterion is not suiting their needs.

Deforestation and Wood Energy

In the beginning of the 1980s when the energy crisis was very intensively felt in the developing countries of the Asia Pacific region there was a greater awareness of traditional fuels especially fuelwood and biomass. In the case of fuelwood there has long been the conception that because the dependence on

fuelwood is so heavy, it is a very central cause of deforestation. But, in recent years, some of the studies that we have carried out do not seem to favour that notion. In Asian developing countries, wood energy is not the primary cause of deforestation, since much of the wood does not come from the forests (compare Tab. 2). Still, there are isolated incidents. There are pockets of areas, where people living in the vicinity of natural forest can and do over-exploit the forest. In those cases, deforestation is a direct consequence of wood fuel usage, but it is not the norm.

Timber-logging and land-clearance for agriculture and human settlements induces deforestation. This is the primary cause in most Asian countries and indeed it leads to wood energy scarcity. In other words, wood energy is in shortage because of the lack of forest and not necessarily the other way round.

But this situation might not be the same in Africa or Latin America. In The 'Forest and Energy'-forum last year we had some very interesting presentations, excellent people from both these continents, and it seems to me that their view is that in countries like for example Nicaragua 90% of the fuelwood is derived from the natural forest itself. In that case fuelwood will play a certain direct role in deforestation. It could be the same with Africa as well. (This assumption was supported by Karl-Hermann Schmincke based on the examples of Ghana and Brazil).

Outlook for the Future

- The high dependence of wood fuels means their role will continue in foreseeable future.

For the Asian part of the world we do not think the current high dependence on wood fuels will change for a very simple reason: even though there is a very large and powerful renewable energy movement and simultaneously commercial energy like electricity, kerosene and coal are all spreading out into the rural areas the one difficulty is that most of them are not addressing the cooking fuel problem. These are looking at household lighting, up-lances, irrigation, water pumping, but not at process or cooking heat. Because of this, we do not see the dependence on

wood diminishing even in the next 30 years or so.

- Substituting wood fuels by fossil fuels is neither economically, nor environmentally desirable

The obvious benefits of wood as an energy source from the carbon sequestration viewpoint are not available to us in the fossil fuel substitution, but unfortunately, in most of the developing countries of Asia the route taken is to substitute wood fuels by fossil fuels.

- A more prudent strategy is to promote sustainable wood energy production and use, with emphasis on increasing the useful energy derived. The useful energy concept basically looks at how much heat content can be derived out of a basic primary resource. In the case of wood, due to the very high moisture content, there is a loss of mass and when it is converted, a lot of the heat is first dispersed into the atmosphere. Secondly, because of the inefficient up-lances and stoves that we use, what we really get into the useful product is very limited. The up-lance efficiency of traditional wood burning stoves is perhaps as low as 7%. That means that 93% of the heat is dissipated into the atmosphere.

But, this could be a low number because in many rural households the same stove while cooking is also used for heating the space in wintertime, so there is some more useful energy coming out. Still, the focus will be on sustainable wood energy production and use with emphasis on increasing the efficiency of this resource.

Sustainability Considerations

As mentioned already we need to look at sustainability from the viewpoint of equity first, especially poverty alleviation and gender. What role wood energy will play?

Secondly, we need to look at efficiency. Whether there is a set of conversion technologies which can provide more efficient wood energy is very important. So long as wood as an energy source remains out of the market we can not put a price to it. If we can not put a price to it, we have very limited policy influence on it. We can only police, we can

only legislate, but we cannot control our influence, the demand, in the absence of a valid price mechanism.

Lastly, we have to look on the environment, both from the viewpoint of global impacts and from the viewpoint of reducing local impacts such as in door air pollution.

Potential Options

- Supply side measures
 - Reforestation, afforestation, social and community forestry, agroforestry, fuelwood plantation
- Demand side measures
 - Large-scale biogas, wood gasification, co-generation and self-generation by wood-based industries, improved stoves, efficient cooking utensils, building architecture
- Integrated systems
 - Private ventures combining fuelwood plantation, conversion and efficient devices, grid connected systems, hybrid renewable energy systems

By and large, the supply side options are already being taken largely by the forestry people. The energy people do very little in any of these except perhaps in the case of fuelwood plantation.

It is on the demand side measures: to improve the availability of wood as a resource is one thing, to make more efficient use of it, another. Some of the most critical options for us seem to be large-scale biogas plants. Countries such as India and China have millions of biogas plants of a small to medium scale. Even then I do not see that they have been able to substitute wood fuel usage by a very large quantity.

The main problem is that biogas is a very difficult to produce resource; it is not so convenient like LPG. What we are looking for is some private sector initiatives, perhaps having centralised biogas production either as network distributed or in the form of cylinders to distribute. Put the same level of convenience as LPG can provide! If we can achieve that kind of substitution, that will perhaps be the most important step in sustainable wood energy, because we are directly attacking the problem of cooking fuels.

There are other technologies like wood gasification, co-generation and so on and so forth, but the main feature to me is: any fuel that can replace wood as a cooking fuel is going to be the most important factor in making a difference.

Lastly, there is also a possibility of integrated systems like private ventures which combine from the supply side like fuelwood plantations all the way up to the end use technology.

Barriers to Sustainability

The first and foremost barrier is: there is no one such thing as wood energy policy. It is scattered across any sectors like forestry, agriculture, energy, environment, rural development and so on and so forth. But, having said that, the one promising aspect, in Asia at least, is that in most of the countries the policies are in place for sustainable wood production, for marketisation of the rural economy and for promotion of advanced technologies. All those policies are there, I do not think the lack of a supporting policy is a problem, the real problem is how to find a niche for wood energy development within this policy framework.

There are legal restrictions on wood movement and trade, not necessarily for wood energy, but this inhibits the commercialisation.

Then, of course, there are

- the usual institutional responsibilities
- lack of emphasis in national energy

plans (view of wood as a fuel of last resort)

- thrust towards substitution of wood fuels by fossil fuels
- marginalisation of advanced wood/biomass technologies under renewable energy development and
- problems of accessing venture capital.

Opportunities for North-South Cooperation

The wood energy sector offers opportunities for a world-wide partnership, especially in

- technical assistance and financing for effective use of land outside natural forests
- transfer of advanced wood and biomass energy conversion technologies, especially biofuels for cooking and heating and
- stressing income-generation potential of wood fuels under poverty alleviation, micro-finance and gender development agendas.

Summary

In the sense beyond looking at wood energy just as a primitive resource, what we really require to do is to look upon it as the fuel of the future. If we look upon it as just direct conversion into inefficient cook stoves than of course the motivation is foremost to try to substitute wood energy by something else. The most important point in wood energy is, and the most disappointing factor for me having been associated with the world renewable energy movement for

the last 10 years is, that when I attend the renewable energy conferences, dialogues, negotiations for anything and everything the bulk of the arguments and the bulk of interest is not in wood or biomass, it is in solar, and photovoltaics primarily, it is in small hydropower sometimes, but mostly solar and windpower. These are the options which the private industries from the industrialised world are promoting, these are the options which the governments are promoting both from the donor side and from the recipient side. This is where I think we might be going wrong because the one important distinction is: biomass and wood energy are the only sources of continuous power supply. Every other renewable energy resource is an intermittent resource. That means, either by time of day that resource is not available, or during a season of the year the resource is not available. This is the only resource which has full potential to give 24 hours, 365 days a year. This is the most grossly under-utilised resource. So I would end this by making a plea that wood energy is not necessarily bad, in fact we think it is actually good but not enough effort has been put into it.

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Forest Biodiversity – A Treasure of Ecological and Human Communities: Concept and Practice of Current Use

S. John Joseph

Abstract

The theme of the Forest Biodiversity Forum held in 1998 is highlighted. The divergence between Western perception and that of the communities of people directly in contact with biodiversity influencing their socio-economic life in tropics.

Solutions of biologically simple forests of temperate and boreal countries are not applicable to richer forests of less developed economies of tropics.

The erosion and loss of traditional knowledge undermines the stability of communities culture and conservation. The effect of "Globalisation of Economies" and "Information Technology" on marginal people and the need for location specific solutions to biodiversity problems – Bio-regional approaches adopted for conservation. The concept of sustainable forest management and how it can be secured. The landscape approach, the ecosystems based approach leading to tropical forest management.

The recommendations arising out of this are multiple use forest management system with full participation of people. Need for greater attentions to sustainability of NTFP resources in management system with suggested approaches. The segregation in the concept of Protected Areas and production forests. Conserving biodiversity through the community management of forests with localised participatory decision making approaches. Examples of natural resource management and joint forest management, people's participatory management with microlevel planning and stakeholder approach. The concept and practice of capturing cultural, spiritual and functional values of biodiversity in Sacred Groves. Sacred Groves an ancient forest conservation tradition. Way back in 1862 Dr. Dietrich Brandis

refers to it in glowing terms, as **Indigenous Forestry**.

The role of agroforestry in providing environmental, livelihood and economic security. The scientists role and contributions in promoting agroforestry in developing countries in deforested and unused lands is stressed. The experience of Tree Growers Cooperative in India highlighted. The international initiatives in securing sustainable forest management by CBD, IFF, IPF and WCFSD for Biodiversity Conservation. The relevance of "Criteria and Indicators" approach for management of forests, developed separately for tropical forests, temperate forests etc. in this context.

The policy that works for Forests – Approaches and advocacy suggested for consideration and adoption.

Introduction

The Forum on Biodiversity: Treasures in Worlds' Forests held in Schneverdingen in July 1998 was attended by 150 scientists, foresters and conservation practitioners from 35 countries. The following emerged as major themes.

- There is divergence between biodiversity as seen by "Western" science and as seen by the diverse communities of people more directly in contact with biodiversity in the Tropical forests: "Science" tends to reduce biodiversity to components through lists of species, hot spots, biodiversity indices etc. whereas most cultures see biodiversity in terms of assemblages of species and attach values according to the ecological services, provided and the many uses made of these assemblages, many of which may be of cultural and spiritual significance.
- The erosion of our knowledge of biodiversity caused by the loss of local

cultures and languages: since value is not an intrinsic feature of biodiversity but is a function of our knowledge of any species or community this loss of knowledge represents a loss of value and undermines the stability of communities and their conservation.

- The relative merits of biodiversity conservation being an indispensable component of integrated multiple-use forest management systems as in much of central Europe or alternative approaches based on a clear segregation between "production forests" and "conservation forests" as in Australia, New Zealand and some tropical countries.
- The potential impacts on biodiversity of the "Globalisation of Economies" and the "Information Technology" revolution: Globalisation will lessen the "control" that sovereign governments can exercise over their natural resources whilst the greatly improved communications resulting from information technology should lead to greater empowerment of hitherto marginal peoples.
- The recognition that solutions to biodiversity problems will usually be location-specific and will depend on the social and economic conditions of a location as well as on the biophysical characteristics of the forests and their biodiversity.
- Solutions appropriate to the biologically simple forests of temperate and boreal countries with advanced economies may not be applicable to the biologically much richer forests of the less developed economies of tropical regions
- Economics has a valuable role to play in helping to make better decisions relating to biodiversity but conventional economics does not adequately capture many of the cultural, spiritual or ecological values of biodiversity.

The Forum saw the CBD as continuing to be the prime focus for international action but recognised that there are limits to what can be achieved through "inter-governmental" action. There is a **need for parallel actions at the national and local levels and in the corporate sector**.

The forum also noted the potential for the "Intergovernmental Forum on

Forests” to play an important role but felt that the IFF had only made modest progress on biodiversity.

The workshops elaborated a number of conclusions and recommendations which are listed below:

The work of the CBD has benefited greatly from contributions provided by science. However the full potential of the scientific community not yet been mobilised. It is recommended that there should be greater engagement of Social Scientists familiar with Traditional Ecological Knowledge (TEK), and of practitioners of “informal” science – the specialists, often from cultural minorities, the repositories of much traditional knowledge.

Economic analysis has a major role to play in improving decision making on forest biodiversity but it is recommended that further development of techniques is needed to recognise the values that different cultures attach to biodiversity and to better capture the cultural, spiritual and functional values of biodiversity.

“Western” science and “economic globalisation” may tend to favour outcomes in which biodiversity conservation (nature reserves) are segregated from production forests (plantations). These tendencies may run counter to the interests of cultural minorities for whom integrated multiple-use solutions may be more desirable. It is therefore recommended that **bio-regional approaches be adopted for conservation planning with full participation** of all concerned people in order to optimise all products and services of forests and achieve better allocation of land.

There has been considerable achievement in central Europe in **reconciling natural forest management** and the conservation of biodiversity. Whilst recognising that this experience cannot be transferred directly to the differing biodiverse forests of the tropics it is nonetheless recommended that attempts to achieve biodiversity conservation in the context of **locally driven multiple-use forest management systems** in the tropics should be vigorously pursued.

Protected areas allocated primarily for biodiversity will remain a central

element of conservation. It is recommended that renewed efforts be made under the CBD and IFF to achieve the medium-term security of a core set of forests sites of recognised international value. The opportunities already provided by ongoing activities such as the WWF “Global 200 forest ecoregions” programme and the forest initiative under the World Heritage Convention be supported.

It is recommended that ICDP approaches which have in general produced disappointing results should be led by local communities and not imposed upon them. The success of ICDPs will be enhanced if they are based upon local understanding and valuation of biodiversity.

Developing countries and cultural minorities ought in principle to be able to derive greater economic benefits from the exploitation of their biodiversity for use in the pharmaceutical, fibre, food and technology based industries. There is however a danger that the benefits of “bio-prospecting” accrue largely to industry and not to the communities of people who are the traditional users of the resource. It is recommended that bio-prospecting be promoted as a legitimate way to access a valuable natural resource but that institutional arrangements to ensure the equitable sharing of benefits be further studied and where appropriate strengthened.

It is recommended that technology transfer (including biotechnology) and capacity building in developing countries should be facilitated and biosafety considerations should be incorporated in the development of forest management practices and products.

Non-timber forest products are a vital resource for very large numbers of people in the forested regions of the world. The value of this resource is often under-estimated in formal decision making, partly because many of the products are not traded in the formal economy. It is recommended that greater attention be given to the sustainability of NTFP resources in multiple-use systems and that the interests of the people who depend upon them be given greater weight in decisions relating to the use of forest lands.

Technological options exist to restore forest cover of degraded lands in many parts of the world. At present much reforestation and afforestation use techniques which lead to biologically impoverished forests. It is recommended that greater attention be given to increasing the species richness of artificially established forests.

Information gives value to biodiversity. The globalisation of information systems creates opportunities but also creates some threats. Information may not be available equally to all stakeholders. It is therefore recommended that the recording and protection of traditional information be given more attention and that attempts be made to make information available locally so as to counter the present trend towards domination by a small minority of global news and information sources.

Protecting forests and biodiversity requires protecting the cultural and linguistic diversity of indigenous peoples. Scientists must recognise that the existing biodiversity paradigm has in the past been misused to alienate and disenfranchise peoples from their spiritual and natural resources and that future scientific endeavours must be built upon recognition of basic rights and recognition of traditional ecological knowledge.

From the wealth of these recommendations I shall focus on the following specific recommendations:

1. Community Forestry
2. Joint Forest Management
3. Traditional Forestry and Sacred Groves Conservation
4. Agroforestry
5. NFTP
6. Research and Training

The approaches to Sustainable Forest Management broadly captures the essence of all these recommendations of the Forum of Biodiversity

Objectives of Sustainable Forest Management

In order to secure this range of economic, ecological and social values, we must develop a strategy for SFM which must reflect the following objectives:

1. To indefinitely satisfy needs for timber, fibre and non-timber forest products
2. To ensure conservation of soil and water
3. To sustain the resilience and renewal capacity of forests
4. To support the food security and livelihood needs of marginalised communities which are dependent on forests
5. To conserve biological diversity
 - To achieve all the above consistent with the incremental productive capacity of forests and the requirements of ecological security
 - To realise a more equitable sharing of the benefits from the uses to which forests are put
 - More organised management, cultivation, harvesting and utilisation of minor forest products as potential pillars of sustainable forestry to sustain livelihoods from dwindling resources
 - Reduction of industrial pollution which is inimical both to soil and atmosphere, affecting the forests and biodiversity
 - Better management of effluents which have serious degrading effects on soil and flora
 - Securing tenurial rights of the millions of people living in villages skirting forest areas as a means to promote conservation.

Forest, a Treasure of Ecology – its Sustainable Management

Landscape management

With escalating human demand on a shrinking natural resource base, it is vital that planning for meeting that demand takes all aspects of the landscape together as a totality. Managing forests for sustainability must emerge from and fit within a broader approach to planning for and managing the overall landscape. A process of landscape planning should lead to identification of how the requirements for forests for conservation, for commerce, and for communities can be met.

Ecosystem-based management

'New Forestry' concept developed by a group of forest ecologists in the USA is a way of managing forest land to conserve a range of 'old-growth' values

while at the same time allowing for the extraction of timber (Gillis, 1990). It was an attempt to move certain environmental groups away from their insistence on forest preservation (which seeks to limit wood harvesting over large areas), and to persuade timber production-oriented foresters to develop and use more ecologically-sensitive systems of silviculture and forest management. Management practices include retention of large decomposing logs as habitat for small mammals, amphibians, and other organisms; and removal of less wood per hectare at harvest time in order to maintain site organic matter resources and carbon storage. But New Forestry ran into resistance from commercial interests on the grounds that this system could lower the yield of logs from the forest, and that much of this loss would be in the more valuable large-diameter logs.

Ecosystem Management involves ecological site classification that identifies ecologically significant variations in climate, soil, vegetation, and ecosystem function across the landscape. Ecosystem Management is also concerned with the rate and landscape pattern of forest harvesting, with watershed effects and impacts on fish and streams, and with wildlife habitat. Many of the ideas of New Forestry are incorporated into Ecosystem Management, but the latter goes further. Although there is still much debate about Ecosystem Management, the concept is fast being accepted as the ecological foundation for sustainable forest management.

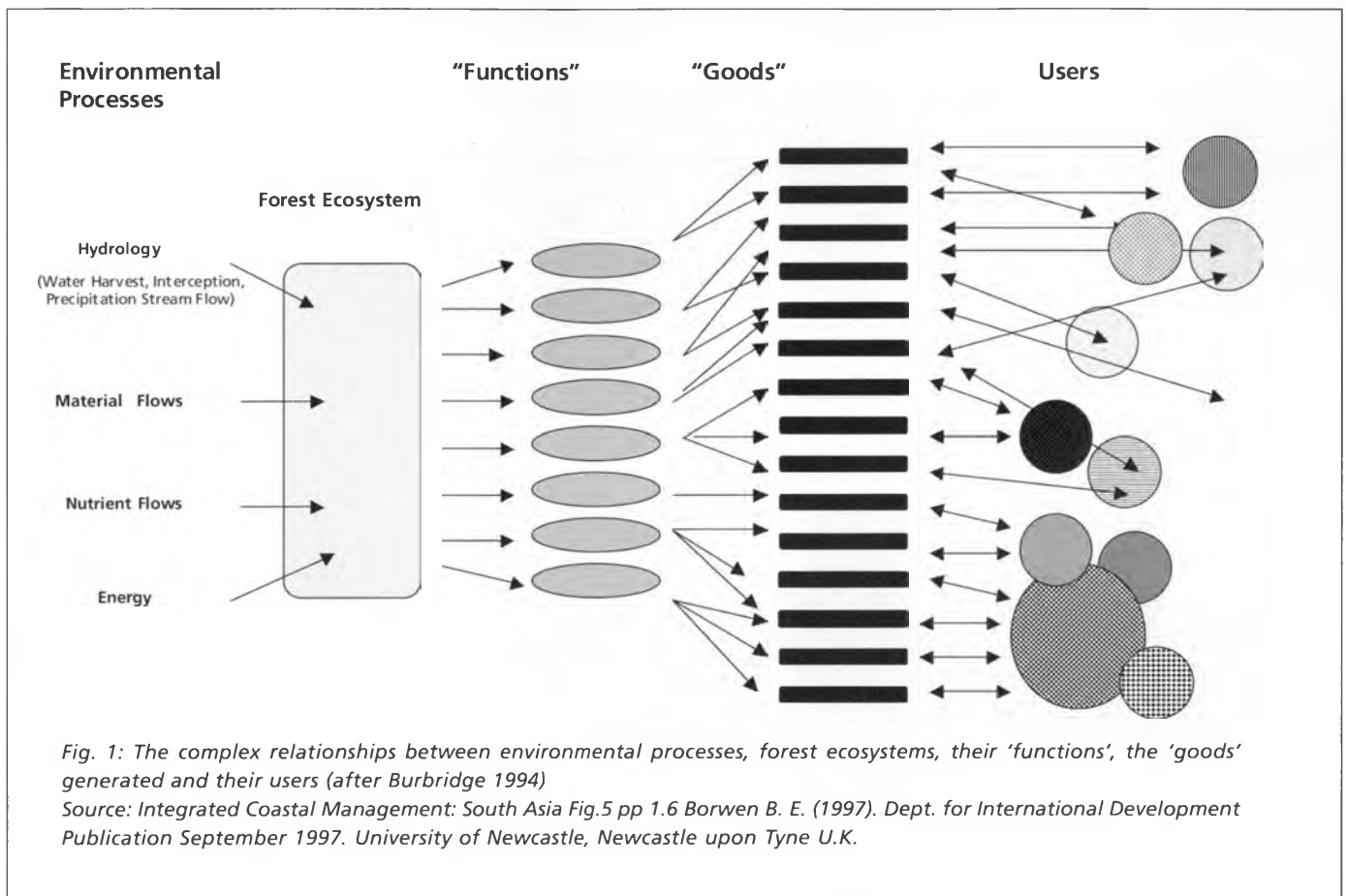
Experience has led to a better understanding of the ecological constraints to forest growth and regeneration, and therefore to a better appreciation that management specificities will vary according to type of forest. Temperate, boreal, tropical, or peat swamp forests behave in different ways and will respond differently to a particular use or threat. Thus no prescription of forest management practices will be appropriate to all contexts. Traditional silvicultural knowledge needs to be fused with the new technologies of information capture, processing and analysis. The ability to communicate these ideas to non-technical audiences is also becoming a necessity.

Tropical Dry Forest – A Treasure and its Management (Shepherd et.al. 1993)

The world's open forests include most dry forests. While much global attention has been focused on destruction of tropical rainforest and its consequences, less attention has been given to the tropical and sub-tropical dry forests. Yet dry forests are at least as problematic and are disappearing as fast. Because such forests occur in more densely populated regions than rainforests, their disappearance is likely to have a more severe impact on people living nearby. **They are usually also major sources of fuelwood for rural and urban markets.** Their disappearance will increase rural poverty and desertification (as it already does in parts of the Sahel region).

Tropical and sub-tropical dry forests are important for a variety of reasons. Like the rainforests, they protect and cool soil, directly affecting soil fertility and productivity. They also act as a store of carbon and are therefore relevant to dealing with climate change. While they contribute less moisture to the atmosphere than rainforests when they are removed, the increased albedo effect is marked. They support larger numbers of people and domesticated animals per hectare than do rainforests, though their carrying capacity is still relatively low. Humans have learned to live in symbiosis with these woodlands by relying both upon the milk and meat which animals produce from tree-browse, and upon the replenishment of soil fertility which the trees bring to agriculture.

Dry forest management has also benefited from improved understanding of the social and ecological significance of such forests. From a technical perspective it has been recognised that earlier attempts to meet forest product needs by establishment of dry-zone tree plantations is not much of an answer. The emphasis has shifted to management practices aimed at sustainable harvesting of the slow-growing but ecologically robust indigenous tree species of open savannahs and desert margins. Requirements of pastoral communities have been recognised as important. Management techniques such as frequent light lopping of trees have been shown to produce more digestible fodder.



Goods and Services by Forest Management

The complex relationship between environmental processes, forest ecosystem function, the bewildering varieties of goods it generates and the plethora of services and users thereon are depicted in Fig. 1 and Fig. 2.

Non Timber Forest Products – A Treasure of Forest Biodiversity

There has been increasing emphasis on management for preservation of non-timber forest products and services that are essential to the way of life of forest communities, and for preservation of the biodiversity, carbon sequestration, and watershed catchment protection benefits of tropical moist forests. The trend toward multiple end-use management of tropical moist forests reflects recognition of the wide range of forest goods and services that they provide.

"Minor forest products now form the potential pillars of sustainable for-

estry which need more organised management in their cultivation, harvesting and utilisation aspects in catering to the changing needs of the people in a dwindling environment".

These products play a crucial role in supporting community welfare as significant sources of edible product, fodder, fuel, fertiliser (mulch), fibres, medicines, gums and resins, oils and construction materials. Millions of people around the world living in the vicinity of forests, subsist on these products. They help to provide opportunities for additional employment and income. Activities related to the collection and primary processing of NWFPs lend themselves suitable for equitable participation of women and indigenous people. While some of the NWFPs, have entered national and international trade, they tend to have the comparative advantage in supporting development of rural and backward areas.

Over a period of time, however, a

number of NTFPs have been channelled into markets in a big way – domestic as also international mostly in unprocessed or semi-processed forms. This had led to a regular export-import trade of NTFPs between India and several other countries. The quantity exported and the revenue earnings from exports of NTFPs from India has been found to significantly increase for a number of commodities. On the other hand, imports of some NTFPs have shown a decline either due to significantly increased production within the country or availability of suitable substitutes for imported NTFPs. Whatever the case be, export-import trade of NTFPs does play a very significant role in developing the economy of the country through foreign exchange earnings.

The recommendations for NTFP management:

1. Well laid objectives and approaches for future management
2. Organised management for cultivation, harvesting and utilisation

3. Quantitative resource accounting and assessment of production
4. Nationalisation of trades – considering the exploitation of poor / tribals
5. Procuring and value addition strategies to benefit poor local / tribal people
6. Effective marketing / trade information system
7. Export and Import balance consistent with national economy
8. Well defined symbiotically beneficial balanced relationship between developing and developed countries (To develop natural resources and share knowledge and technologies)
9. Viable working policies under GATT & TRIPS.

Forest Biodiversity – A Treasure of Communities

Conserving through Community Initiatives

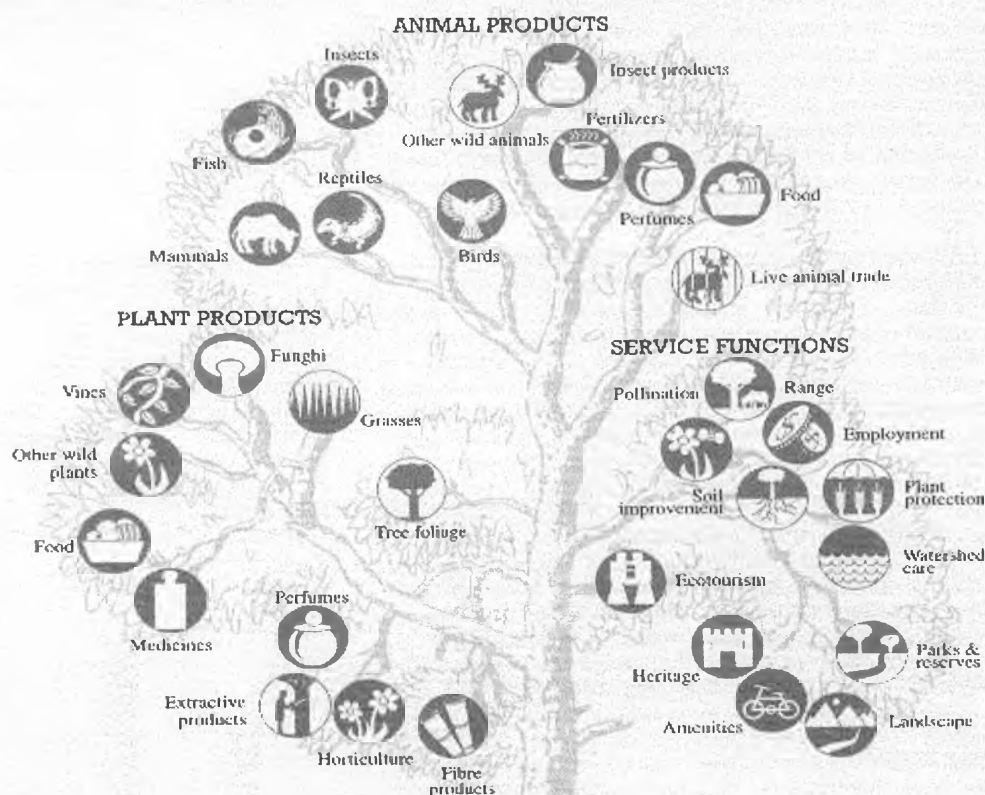
Community forestry offers a practical means of conserving at least a part of the biodiversity present in the original forests of an area. The original forest may have been fragmented by agricultural and other development and broken down into relatively small areas which would not be considered viable as “**conservation reserves**”. However, these areas may only be separated by agricultural land over relatively short distances and there are usually few barriers to the movement of wildlife or to the dissemi-

nation of plant propagules between areas.

Forested areas managed by an adjacent community provides forest products required for everyday living such as fuelwood, lumber, food, medicines, fodder and bedding for animals, and even foliage and blossoms for religious ceremonies. These areas cannot, therefore, be managed in the same way as conservation reserves in richer western countries – a policy of relatively open access must be followed.

These demands will inevitably lead to the loss of many biological elements of the ecosystem. This will apply particu-

The NWFP horizon



Non-wood forest products can be classified by source (plant, animal and so on) or by uses, for instance as food, medicines or fibres. This overview symbolizes their great diversity. Vital services such as soil conservation, biodiversity, climate regulation, watershed protection, and so on, are also shown here, though not discussed in depth in this report.

Fig. 2: The non-wood forest products horizon

larly to those plants and animals which are of less use to the community or which cannot withstand the low-key but constant levels of visitation and harvesting which will inevitably take place. Poor communities living very close to the edge cannot afford to observe the niceties of conservation biology and will not do so unless it is worth their while.

Many small communities have managed their own forest resources successfully in the past (for Nepal, see Mahat et al. 1987). Older members of many communities remember the ways in which the forest was cared for and that the system, with all its problems, did work and the forest was not destroyed.

These same communities have become increasingly disillusioned with the ineffective attempts of government agencies to protect their forest resources. They see government staff as unwilling to participate as advisers to local communities, unwilling to listen to local advice, and who allow outsiders to take and to use forest products which the local people rightly see as theirs. Government staff act more often as policing agents rather than as extension officers, hampering and badgering the local population for the sake of meaningless regulations rather than assisting them to conserve and to use resources wisely.

This is not particularly a criticism of the individuals concerned within the government service who are ill-prepared for the role they should play. All too often they have few if any extension skills and inadequate technical skills to be of assistance when asked for advice. They have duties which are handed down to them by superiors who do not understand the local situation. Government legislation may not support a community forestry thrust. Old guard members of the bureaucracy may be unwilling to allow any change in the *status quo*.

The experience of the Nepal-Australia Community Forestry Project* in Nepal has revealed that villagers have an impressive capacity to adapt to introduced technology and to be able to establish successfully significant areas of new planted forests. The earliest forests were established with species which were easily raised and hardy when planted out. Gradually the villagers have moved towards planting species which they see as more beneficial to them. They have accepted advice on how to coordinate seed collections and, where seed is not readily available, to raise planting stock by using vegetative propagation methods, such as cuttings. The range of skills which need to be introduced to a forest user group is quite wide.

Once plantations grow to maturity and protected residual forests are rehabilitated and have stocks of harvestable material, it will become necessary for communities to undertake careful harvesting of their new resources. In some instances it may be advantageous to establish **local cooperative industries** to allow value-added production of products for sale.

Participatory decision-making

Managing forests sustainably **involves more than technical matters**. It must **get to the human issues** – betterment of the human condition, social equity, poverty reduction, power relations, gender roles – which lie at the heart of forest resource problems and conflicts. Embracing these human issues requires the participation of a broad cross-section of people in planning for and decisions about forest management.

Governance mechanisms to be put in place to open up the decision-making process and involve civil society and especially groups directly affected by forest land use. Improved participation in decision-making regarding forest use will not by itself deliver societies to the 'promised land' of sustainable forests. But

participation is one of the foundations for sustainable development, and is in turn a prerequisite for more community involvement in forest management.

An extensive review of community forestry projects has led to the identification of key principles to apply in a participatory approach to forest management.

Localised Management

In many countries there is a history of community management of forests. It is true that much of that has been displaced through state acquisition and control of forest lands, through operations of large timber corporations, and through insecure land tenure. There appears to be, however, a renaissance of community involvement in forest management. Localised management of forest resources is more likely to alleviate poverty by a more equitable sharing of the benefits from the use of this public resource than large-scale corporate exploitation of forests has done.

Localised forest management in India – JFM

Some of the most promising experiences of dryland forestry management come from India where Joint Forest Management (JFM) schemes have emerged as a highly influential force in restoring India's degraded forest lands (Poffenberger and McGean, 1994). JFM is a variant of community forestry widely adopted in India, in which responsibility and benefits are shared by local user groups with government forestry departments. As of now, 16 of 25 states in India have issued JFM agreements covering about 2 million hectares of forests. JFM agreements are an increasingly influential worldwide model in attempts to reverse deforestation trends and uplift disadvantaged rural groups (Jeffery, 1997).

In some regions of India self-initiated community efforts to manage forests have proved more effective at regenerating forests than government support

* The Nepal-Australia Community Forestry Project, in operation since 1978, is a joint undertaking between His Majesty's Government of Nepal and the Australian aid agency AIDAB. It is managed by ANUTECH Pty Ltd, the company of the Australian National University. The project has been operating east of Kathmandu in two districts spanning 0.5 million ha. and a rural population of about the same number. It has assisted in the establishment of more than 20,000 ha. of plantations and the management and rehabilitation of large areas of remnant forest by community groups.

ed JFM programmes (Krishnaswamy, 1995). Without waiting for supportive policies and judicial decisions, through the 1980s and 1990s thousands of communities began protecting their degrading forests, primarily in eastern India" tribal forest tracts. Often with little or no outside help from government, NGOs, or donor programmes, village leaders began recognising the environmental crisis confronting them as their once densely forested hills were denuded. Communities formed hamlet-based forest protection groups and halted cutting and grazing, often initiating rapid regeneration on the natural forests.

Over the past decade, 120 villages have joined the original five in the Kurda Forest Division alone. Now in Orissa state, 4,000 communities protect over 250,000 ha of vigorously regenerating mixed *Shorea robusta* forests. In response to these growing political demands of village communities, a national policy breakthrough occurred with the passing by Government of a new National Forest Policy Act in 1988 that explicitly recognised the legal status of Joint Forest Management contracts. By 1996, between 10,000 and 15,000 communities across India joined this grassroots forest protection movement with minimal cost to the government. In many areas, flora and fauna that had been disappearing from these habitats have begun to return.

Summarising the approach for participatory plan of resource management by communities having direct stake in management, briefly the elements are;

1. Productivity, Sustainability and Equity and Participatory Development to be accepted in principle
2. Participatory Natural Resource Management (Planning by People)
3. Fulfilling conditions for Participatory Management
4. Types of groups to be recognised
5. Joint Forest Management
6. Micro – Level Planning – Stakeholder approach trades off and conflicts
7. Community Natural Resource Management groups, structure, recognition issues, responsibilities legal status, role of women, role of panchayat, benefit sharing etc. and finally
8. Collaborative Management.

Much ground still remains to be covered, however. For example, the sharing of power between government forest agencies and local groups may still be far from satisfactory. Consider this statement from a woman in India: "I wish to demand a Joint Forestry model. **But a model in which roles are reversed.** So far the Governments owned the land and the poor toiled on it to plant and raise trees. I wish to change this role assignment. Let the rural poor women own the plots on the canal side or road side or other places. Let the Government's Forestry Departments provide their technical and professional services to these women on a demand basis. Let us move away from supply side forestry to demand driven forestry. But the demand addressed must be that of the poor women" (Batt, 1997).

Agroforestry and tree planting by rural poor people – Futuristic Potential

Many of the world's one billion poorest people are highly dependent on management of remnant woodlands, on-farm trees and agroforestry farming both for subsistence needs (fruit, fuelwood, fodder, medicinal products) and income generation. There are many well-documented examples of how local communities and small farmers have been sustainably managing forest resources and on-farm trees based on traditional knowledge over long periods of time (Arnold, 1992; Barrow, 1986; King et al., 1990). The development imperative of poverty reduction justifies special emphasis on local community efforts and on the major role they play in improving the welfare of local people – particularly the rural poor.

There is already encouraging evidence that agroforestry represents a solution. As common property resources disappear or are degraded, farmers have sought to shift the production of outputs of value into their own land by protecting, planting, and managing trees of selected species alongside their normal agricultural activities. Many farmers now depend on their own tree stocks and on agroforestry systems for some products and on common property resources for others. Recently the process of adding trees to farming systems has been accelerated or transformed by the growing commoditisation

of fuelwood and other tree products, and the consequent emergence of the growing of trees as a cash crop.

Environmentally and economically the trees are a boon to the farmer and it is no wonder that *eucalyptus* planting has been taken up with misguided enthusiasm. The limited agroforestry approaches has not only revolutionized tree culture but agriculture as well and its contribution to the prosperity of the region is conspicuous.

The motivation may be diversification of production for meeting their own requirements, cash generation, or even the scope for sustainable production in marginal and arid areas compared to the field crops. Some farmers have already taken the initiative in this direction, and to meet the need for an appropriate management strategy for tree-crop integration the national governments have started strengthening the research and development infrastructure.

Farmers in the subcontinent basically practise a mixed-farming system. Their way of life is an integration of different components for optimum production without necessitating much external input. Agroforestry presents an excellent opportunity for such low-input socio-economic situations as it provides for the integration of various production factors for achieving need-based goals. Whether it is the problem of apple boxes in the hills, or fodder and fuel in the semi-arid / arid areas, or shelterbelts in deserts, or ground cover in high-rainfall areas, or cash crops in high input areas, trees can play a role and can be suitably integrated with the existing agricultural production system. The scientists engaged in agroforestry research have to identify trees for a specific role in a particular ecosystem and to synthesise and develop the agroforestry system based on existing components so that the production can be optimised without impairing the quality of the resources.

The practice of agroforestry is widespread in the tropics. The types of systems used are consequently diverse and complex. However, all systems include three basic components – woody perennials (trees), herbaceous plants (crops), and animals. The main agroforestry sys-

tems have been broadly classified as:

- Agrosilvicultural (crops and trees)
- Silvopastoral (trees and pasture/animals)
- Agrosilvopastoral (crops, trees and pasture/animals).

Presently some initiatives are being undertaken by the governments, farmers, non-government organisations and industries in the subcontinent to develop appropriate agroforestry systems and popularise them. Matchbox and paper industries have introduced cultivation of poplar trees in the areas above 30° N. Farmers have taken to planting *Eucalyptus*, *Casuarina* and *Acacia* trees either on field bunds or as block plantations. Cul-

tivation of fruit trees has become popular in marginal lands in the arid regions. However, these efforts are only the beginning. Further sustained effort is required to develop agroforestry systems suitable for each agro-ecological region of the Indian subcontinent.

Tree Growers' Cooperatives in Maharashtra State, are pioneering organisation of its kind in India. The experience of Agroforestry Cooperatives in Maharashtra shows that the following factors are needed for ensuring success viz.:

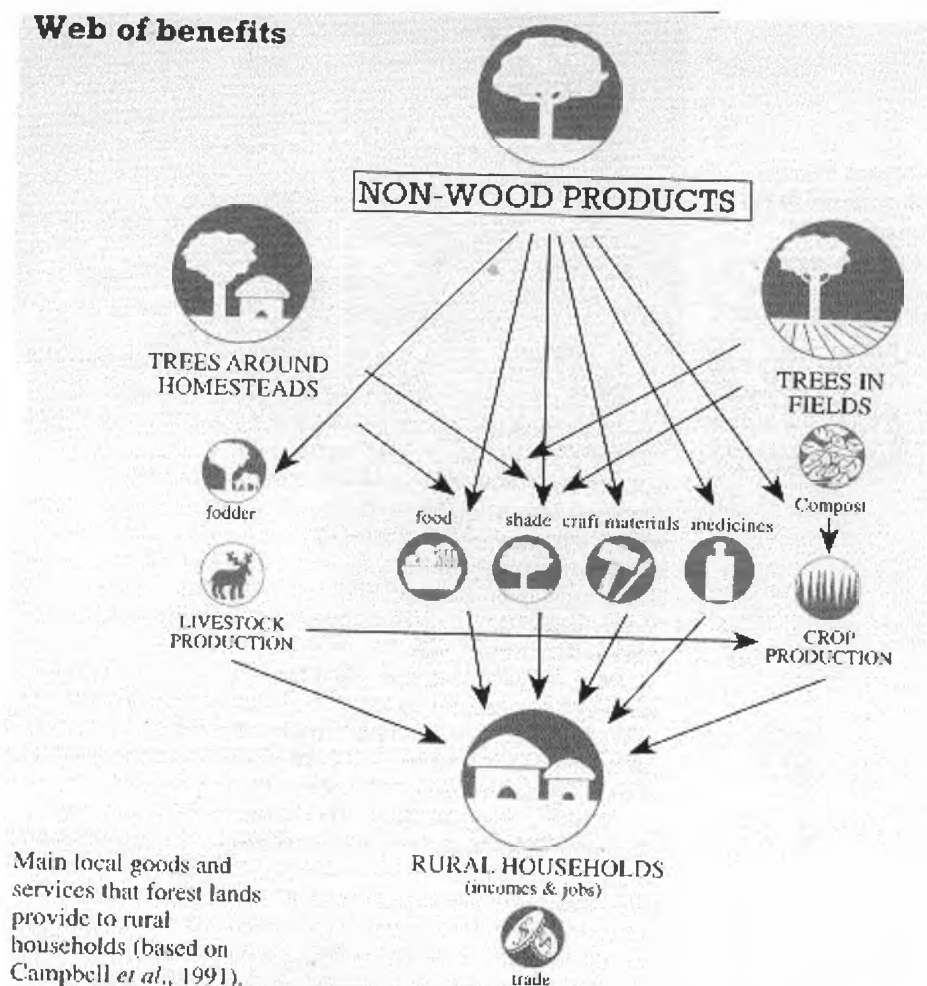
1. Motivation of land-owners
2. Supply of propagation material
3. Knowledge of cultivation practices
4. Finance

5. Felling, harvesting and marketing support

If all the above factors can be made available through the single window system, tree planting activity can take place on massive scale. Only NGO's and Tree Growers' Cooperatives can provide such single window services to their members. The Tree Growers' Cooperatives can play a more significant and effective role in wasteland development as they have requisite expertise and infrastructure.

Motivation of land owners to grow trees only through publicity and propaganda does not help unless the private

Web of benefits



landowner is convinced that expenditure on development of wasteland is economically viable i.e. he can expect higher income than agricultural crop.

The potential candidate who can accept agroforestry model depend on following factors:

1. Availability and type of land.
2. Availability and quantity of water.
3. Proximity of the farm from the residence of the owner.
4. Availability of trained labour and attitude of the farmer.

When 2 to 3 of the above factors are unfavourable, agroforestry becomes the only alternative.

The key to success of any agroforestry venture is "convenient and assured marketability of the produce ensuring remunerative prices". Experience of Cooperative Agroforestry in Maharashtra shows that by evolving a sound, rational and credible marketing system of the produce, interest of both the Tree Growers' as well as the consumers can be safeguarded.

The agroforestry enterprise depends on the quality of planting material used. By providing genetically superior and uniform planting material, the returns from agroforestry crop can be increased by four to seven times. Tree Growers' Cooperative should be encouraged to have centralised nurseries for producing quality stock, rather than decentralised Kissan nurseries where the quality of planting stock from seed origin cannot be assured.

Maharashtra experience also shows that application of Forest Laws, methods, ethics and morals as applicable to forest lands cannot be applied on non-forest lands as such laws and procedures act as a hindrance or disincentive in the expansion of this useful eco-development activity. The need to liberalise and to do away with transit rules and to make the procedures simple, are essential to give a boost to this environmentally friendly Wasteland Development Programme.

In many situations spontaneous community forest management and on-farm tree planting far exceed the accomplishments of national forest agencies and at very much lower cost.

The World Commission on Forests and Sustainable Development (WCFS) heard during its Asia regional hearing that grassroots efforts by landowners and small farmers in parts of Asia are achieving results where millions of dollars of external funding along with the application of new technologies and policy instruments have failed to dent the problem.

Sacred Groves – An Ecological Treasure

In the cultural history of India nature has a significance very different from what it has in the West. Among the remains of the Indus Valley Civilization that flourished between 2800 and 1800 B.C.E. we find steatite seals with inscriptions in a language still obscure. These seals, sometimes called the first documents of Indian culture, often depict trees in relation to water and to what are evidently goddess figures. On others we find images of the earth as mother giving birth to a tree, and scenes composed of animals, trees, human beings, usually interpreted as revealing the common rhythm in animal, vegetative, and human life.

In various parts of India today we find sacred groves dedicated to a deity that is understood to reside within it. In such spaces, sometimes twenty hectares in area, the vegetation of the entire grove is understood to be protected by the resident deity. The removal of even dead wood or twigs from such areas are taboo. Such groves are ancient natural sanctuaries wherein all forms of living creatures are afforded protection. Recent research in villages in the Western Ghats, in which these sacred groves still flourish, indicate that local beliefs support the protection of such groves. Villagers in the region regard the violation of taboos concerning the protection of these spaces to be fraught with dangers. The breaking of taboos protecting the sacredness of such places are understood to cause serious sickness or death. Such groves probably constitute the only remains of the forests that once flourished on the hilly terrains of the Western Ghats.

Even when they are designated as sacred groves, forests have had a significance for Indian history that is absent in the dominant traditions of the West.

In ancient times villages were responsible through their *panchayat*, their committee of five elders, for maintaining the forests in their region. Forests were utilized by villages who valued them as the source of their prosperity. Other forests were the dwelling of the *rishis*, the mythical authors of the Vedas. They were also the dwelling of those teachers whose forest hermitages were intended to be places set apart from the pre-occupations of worldly life, a place pervaded by the sense of the presence of God. In ancient times, the shade of a tree was the proper place for a disciple to receive spiritual instruction from his guru. From such places there arose the profound literature that was the source and background of the *Upanishads*. They were called the *Aranyakas*, the forest books. Near the places where the sages lived no animal or tree was to be harmed. Even kings were forbidden from hunting in regions close to these dwellings.

As early as 1862 Dr. Dietrich Brandis, the First Inspector General of Forests of undivided India wrote with admiration about the widespread network of sacred groves in India. At various times, he referred to these as the 'traditional system of forest preservation' and 'illustrations of indigenous Indian forestry'. He had himself discovered sacred woodlands to be 'most carefully protected' in many districts and in nearly all provinces of British India – from the Devara Kadus of Coorg in southern India to the sacred groves provided evidence of a decentralised system of forestry.

Living in harmony with nature has been both, a way of life and a means to livelihood among tribal families. This has led them to evolve a unique system of knowledge about the utilization and conservation of plant genetic resources by way of trial and error. Sacred groves are no exception to it. A detailed study on understanding role of some tribal communities of Alibag Taluka (Raigad District of Maharashtra) was conducted to document their traditional knowledge of plants of sacred groves for medicinal and other purposes. This helped in (a) correlating issues of forest degradation with that of the livelihood options of tribal communities as well as (b) a better perception about indigenous knowledge of these people that led to preservation of sacred groves.

Tab. 1: Distribution of sacred groves as well as plants in various agro-climatic zones of Maharashtra

Category	Agro-Climatic Zones of Maharashtra								
	01	02	03	04	05	06	07	08	09
Sacred Groves (No.)	1537	50	855	298	38	13	04	04	09
Families	125	108	121	125	79	34	28	24	20
Genera	458	368	435	359	216	52	43	39	31
Species	630	780	715	671	292	62	52	53	41

Total no. of sacred groves recorded = 2808

Total no. of plant species recorded in all the sacred groves = 1040

Development of strategies for conservation of sacred groves in Maharashtra was a major outcome of a workshop held in Maharashtra State in May 1999.

Number of sacred groves in Maharashtra:

Based on the extensive surveys conducted by BNHS scientists in all the districts of Maharashtra, a detailed list of 2808 sacred groves occurring in all the nine agro-climatic regions of Maharashtra was prepared. During the explorations BNHS scientists visited every Taluka of the State and established contacts with various State Government Departments, such as Forest and Revenue, and also village level committees such as Panchayat. As seen from Table 1 about 1040 plant species were recorded during the floristic survey of sacred groves.

Area under sacred groves in Maharashtra:

The sacred groves in Maharashtra varied in size – ranging from few gunthas up to even 200 hectares. The

size class of sacred groves of Maharashtra are highlighted with the help of Tab. 2.

Flora of sacred groves:

Due to the time constraint, only a few sacred groves were studied for their floristic composition. Over 1000 plant species were recorded during this project period, a summary of which is given in Tab. 3.

Internationally forests back on the agenda – IPFs initiative

CBD rejected proposals for a Protocol on forests or any other instrument on forests under the Convention and instead referred issues to the **Intergovernmental Panel on Forests (IPF)** of the Commission on Sustainable Development. Yet at its first meeting, in September 1995, the IPF ignored biodiversity.

At the second Conference of the Parties of the CBD (COP2), in Jakarta during November 1995, strong lobbying from WWF and other NGOs helped at least partially to reverse this situation. As a result, a clear message has been

sent from the CBD to the IPF, urging the IPF to consider:

- The need to integrate conservation and sustainable biodiversity use into forest plans, programmes and policies
- The importance of environmental impact assessment for activities in forests
- The full range of possible values and benefits of forests, including non-consumptive values
- The need to develop sustainable management systems for forests, addressing economic, social and environmental needs
- The importance of applying an ecosystem approach to forest management, including as an objective the maintenance of forest quality
- The application of *in situ* conservation measures, and their inclusion in forest and land-use plans
- The importance of respecting indigenous people's rights regarding decision-making and benefits from forest biodiversity
- Improvements in education, training and capacity-building regarding conservation and sustainable use of forests.

Tab. 2: Area and size classes of sacred groves in Maharashtra

Size Class	Total No.	Total Area (ha) Covered
Up to 1 ha	1849	581.28
More than 1 ha up to 5 ha	662	1466.23
More than 5 ha up to 10 ha	103	718.91
More than 10 ha up to 25 ha	63	1018.09
More than 25 ha up to 50 ha	17	610.34
More than 50 ha up to 100 ha	07	489.04
More than 100 ha	02	235.58
Are those where details on their area could not be obtained	105	—
Total	2808	5119.42

Whilst this is certainly encouraging, it is by no means all good news. The CBD, which is legally-binding, is pushing responsibility for forest biodiversity onto the voluntary and non-binding IPF.

Criteria and Indicators Approach

There have been many national, regional and eco-regional developments in sustainable forest management, stemming from decisions made at UNCED in June 1992. These initiatives include the 'Helsinki Process' covering 37 countries in Europe, the 'Montreal Process' for temperate and boreal forests outside Euro-

Tab. 3: Distribution of plants (by habit) in various agro-climatic zones of Maharashtra

No.	Habit	01	02	03	04	05	06	07	08	09
1.	Trees	146	191	172	150	78	21	27	30	21
2.	Shrubs	120	159	150	115	49	11	08	07	06
3.	Climbers	42	52	38	33	15	–	–	01	–
4.	Ferns	11	13	12	06	02	–	–	–	–
5.	Epiphytes	09	12	11	10	04	02	–	–	–
6.	Parasites	04	04	03	04	02	–	–	–	–
7.	Herbs	221	250	235	243	101	24	14	11	10
8.	Herb-Grasses	20	31	28	48	14	01	01	01	01
9.	Climber-Shrubs	54	65	61	59	24	02	–	–	–
10.	Bamboos	01	03	03	01	01	01	02	03	03
11.	Bryophytes	02	02	02	02	02	–	–	–	–
Total Species		630	780	715	671	292	62	52	53	41

Total number of plant species recorded in all the sacred groves = 1040

pe involving 12 countries, the 'Tarapoto Proposal of Criteria and Indicators for Sustainability in the Amazon Forest' (8 countries adhering to the Amazon Cooperation Treaty), and further initiatives for Dry-Zone Africa (27 countries), 30 countries in the Near East Forestry Commission, the African Timber Organisation (13 countries), and 7 countries in the Central American Commission for Environment and Development (CCAD). The meetings associated with these have led to much international discussion, at the Intergovernmental Panel on Forests (IPF) of the United Nations Commission on Sustainable Development (UNCSD) and other fora, of the concepts of criteria and indicators, and their application in the measurement of progress towards sustainable forest management. The importance of criteria and indicators has been widely recognised in the deliberations of the IPF.

The original ITTO criteria and indicators differed from most of these later initiatives in two respects: they addressed sustainable forest management at both the *national* level and the level of the *forest management unit*, and they were focused primarily on sustainable management for the *production of timber*, while taking cognisance of the need to conserve biological diversity and protect the forest environment. The later international initiatives extended the scope of the criteria and indicators to

cover the other goods and services provided by forests, but generally confined their attention to the national level¹. Meanwhile, the *ITTO Guidelines for the Establishment and Sustainable Management of Planted Tropical Forests* and *ITTO Guidelines for the Conservation of Biological Diversity in Tropical Production Forests*, published respectively in January and September 1993, laid the foundation for a wider interpretation of sustainable forest management by ITTO. More recently, in September 1997, ITTO has published *ITTO Guidelines on Fire Management in Tropical Forests*. In this context, planted forests are only included when their management is relevant in supporting the sustainable management of natural forests.

The Criteria

The first Criterion addressed (Enabling Conditions for Sustainable Forest Management) is rather different from the others. It is concerned with the general legal, economic and institutional framework without which actions included under the other criteria will not succeed. Criteria 2 and 3 (Forest Resource Security and Forest Ecosystem Condition respectively) are concerned with the quantity, security and quality of forest resources. The remaining criteria deal with the various goods and services provided by the forest (Flow of Forest Product; Biological Diversity; Soil and Water Protection; and Social, Cultural

and Economic Effects). The order of presentation of criteria represents a logical sequence, but it does not indicate any order of priority or relative importance.

Conclusion:

- The surviving forests are sick and unstable because their character and composition are radically altered; they cannot fulfil their productive, protective, environmental and social functions.
- Tropical Forest Management has to be reinvented; it has to be Tropicalized, Indigenized and Humanized. Land is our fundamental resource. Unfortunately, it is this resource which has suffered a great deal; more than half of it is sick.
- Forest Management after Independence and liberation from the influence of Western concepts of Forest Science has made a full circle: From Conversion to Regular Crops back to Conversion to Irregular Crops. This is a welcome trend.
- The trend represents Tropicalization, Indigenization and Humanization of Tropical Forest Management in the country.

Policies that work for forests and people: suggested principles to conserve and save the Treasure

1. Participation in policy and planning. There should be an independent forum at national and sub-national

¹ There have been recent exercises in extending criteria and indicators to the forest management unit, for example in the countries of the European Union.

levels, to understand stakeholder views and needs, forge decisions and develop partnerships.

2. Information, monitoring and research which is designed to deal better with change and actively feed into policy and management processes. Monitoring and information need to cover multiple aspects of forest assets, demand and use, and to involve stakeholders. Research should help to develop capacities to adapt to change.
3. Capabilities to address cross-sectoral influences on forest and people. Stakeholder analysis, impact assessment and valuation approaches may offer useful instruments for understanding.
4. Agreed national goals for forests – based on sustainability, productivity and equity. SFM may provide a compelling trajectory to help stakeholders to work together, but it will need translation into sub(national) standards. The concept of 'security of forest goods and services', to be met from forest and non-forest sources, may be more useful when it comes to negotiating trade-offs within and between local, national and global levels since its focus is on people and what they need from forests, rather than on forests *per se*.
5. Policy instruments better geared to stakeholders and national goals.
6. Decentralisation, devolution and strengthening capacity as appropriate. In many countries this may now be the key issue. For multiple objectives and/or stakeholders, user rights and/or partnership approaches are promising.
7. Standards and codes of practice form improved accountability. Recognising inter-stakeholder dependencies, (sub)national principles, criteria and standards may help in providing practical benchmarks and checks and balances.
8. Democracy of knowledge. Better awareness of aims and standards, and available technology, is needed at all 'levels' for empowering effective forest stewardship.
9. Framework for continuous policy improvement. The above elements of policy formulation, implementation and review require an equitable, participatory process (Bass et.al. 1997).

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Risks and Chances to Market Recreational and Environmental Goods and Services

– Experience from a Hundred Case Studies –*

Udo Mantau, Berthold Mertens, Borris Welcker and Birgit Malzburg

Keywords: non-timber forest products; institutional economics; pricing, legal framework, public acceptance

1. Introduction

The main objective of the research project is to develop market solutions and strategies for various forest outputs, which are considered to be not or hardly marketable. The phenomenon of „public goods“ is considered under dynamic conditions, in which marketability rather is a matter of product and framework development than of objective circumstances. The analytical framework is divided into five tasks:

1. Management of multifunctional forests

2. Strategies for product design and strategies for market transformation
3. Marketing strategies and training courses
4. Contracts, institutions and legal aspects (property rights)
5. Policy analysis and implication

Solutions were found on the basis of 98 case studies, field developments in cooperation with forest land owners and on literature studies.

Some selected results will be presented on

6. The variety of empirical data
7. Pricing as an active tool

8. Market development with contracting and transaction organisation
9. The role of legal framework
10. Public acceptance
11. A Theory for the marketability of public goods

The target of the presentation gives an insight in the market aspect of non-material values, the conditions of market development, the complexity of products and the human factor in marketability.

2. The variety of empirical data

The acronym RES signifies „Recreational and Environmental Goods and Services from Multifunctional Forestry“. Within the framework of the project, case studies have been recorded which if possible should comprise the following properties:

- The owner takes the initiative
- Sale is done by private contracts
- Pricing is targeted towards profitability

We refer to a RES-product the more so when these features are present. Borderlines to other areas, such as nature preservation contracting, however, are indistinct.

Table 1: Recorded case studies of the RES-project

<p>1 Biological production</p> <ul style="list-style-type: none"> ■ Mushrooms (IT01, IT02, IT08, IT19) ■ Meat and game (DE06, NL04, NL11) ■ Christmas trees (DE01, DE13, DE16) ■ Eco-hay (NL08) <p>2 Letting on lease</p> <ul style="list-style-type: none"> ■ Bridle-paths, cycling paths and mountainbike tracks (DE23, DE24, AT01, AT17) ■ Racetracks for cars and a golf course (DE21, IT03) ■ Mountain huts and ponds (IT26, AT06) ■ Downhill ski-tracks and cross-country ski-tracks (DE25, DE26, IT05, IT09, IT14, IT15, IT25, AT13) <p>3 Parks</p> <ul style="list-style-type: none"> ■ Eco-parks (DE03, AT05) ■ Recreational forests (AT21, IT06) ■ National parks and nature preservation areas (NL10, IT23, IT28, NL02) ■ Campsites in the forest (IT11, NL14, NL17) <p>4 Authorization of access</p> <ul style="list-style-type: none"> ■ Parking lots at the entrance of a valley (IT04, IT12) ■ Tickets for parking lots surrounding „Barcis lake“ (IT16) ■ Tolling for cars (IT17, AT08, AT18) ■ Picnic-site (IT24) <p>5 Sports activities</p> <ul style="list-style-type: none"> ■ Riding (DE07, DE28, IT18, NL05, NL07) ■ Mountainbiking (AT02, NL07) ■ Cross-country skiing (DE19, IT09, IT14, IT15, IT25, AT13) ■ Hunting (DE04, DE28) ■ Fishing (DE28, AT20, AT21) 	<p>6 Nature- and environmental education</p> <ul style="list-style-type: none"> ■ Specialized excursion on sustainable forest management (DE09) ■ Adventure holidays in the forest, survival training (DE11, DE12, DE17) ■ Seminars for executives (DE10, DE18) ■ Guided tours through the forests and in the mountains for tourists (DE15, IT10, IT20, AT07) ■ Weekend seminars on forests and environment (NL09) ■ Educational forest facilities (DE27, IT22) ■ Tree top tours (NL13) <p>7 Environmental facilities</p> <ul style="list-style-type: none"> ■ CO₂-storage (NL15) ■ Potable water (sponsoring, water preservation contracting) (DE08, DE14) ■ Potable water (sale) (AT16, AT19, NL01) ■ Environmental sponsoring (afforestations, natural forests, associations) (DE22, IT29, AT09, NL06, NL12, NL16) ■ Cultivation of the landscape, contractual nature preservation (DE05, AT10, AT12) <p>8 Others</p> <ul style="list-style-type: none"> ■ Trademarks (IT13, IT21, IT27) ■ Military training area (AT04) ■ Hydroelectric power station (AT03) ■ Holiday flats in the forest (DE02, DE28, AT11, NL18, NL20) ■ Recreational sponsoring (DE20, IT07)
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Table 1 outlines an overview of the case studies recorded in the framework of the RES-project. In total, there are 98 case studies from the areas of recreation, environment, as well as traditional products which are marketed in the context of recreational and environmental facilities. The categorization was done according to the general view of the potential product range of a forest enterprise. For further explanations of the systematization please refer to MERLO. The cases with their country of origin and the number are indicated in brackets.

Altogether, a closer analysis shows that the products mostly consist of several individual services satisfying different needs. Furthermore, tangible and non-material elements are linked to a package offer in product design. Exclusiveness and competition vary between the different product elements. Moreover, the possibilities of combination are nearly unlimited. In this way, there is a large potential for the marketing of public goods. Products, therefore, are heterogeneous entities consisting of different product elements and levels of benefit.

3. Pricing as an active tool

Pricing, as well, can be manifold and complex. In the case studies recorded, approximately 20 different modes of payment could be documented, in five of which various modes of payment were combined. As expected, pricing very much depends on the product. Tangible products and clearly defined services are remunerated according to consumption. With more complex services (package offers), there are all-inclusive offers or allocable package prices. For the use of (durable) facilities, entrance tickets and permits are issued. With repeated utilization, the service is paid by licences or season tickets.

As prices also depend on a variety of other factors (prices of competitors, customers' preferences, substitutes, market strategies), illustration 2 indicates a large number of further modes of payments respectively combinations of payments. In this way, it becomes clear that pricing in its various forms is an active instrument in the marketing of a product.

Table 2: Modes of payment in the RES-case studies

Source: WELCKER, B., in: Beiträge zur Forstpolitik: Siders/Schweiz 99/3, Zürich 1999; RES, S. 19

Basis and type of payment	
Variable calculation in special case	30
■ Calculation according to the degree of consumption	6
■ Calculation according to duration of service	4
Payment for defined single performance	16
■ Tickets and permits for the single use	5
■ Payment of a fixed amount for a defined service	1
Payment for repeated or various performances	10
■ Duration permits (licenses)	5
■ Tickets for several times of entry and various services	5
Bundle price for service-determined combinations	5
■ „Pure Bundling“ (all-inclusive)	4
■ „Mixed Bundling“ (divisible)	1
Voluntary acquisition of licences	9
■ Payment via subscription	1
■ Voluntary agreement	8
Lease	3
Donation	2
Sponsoring	8
Payment through quid pro quo	1
Combined payments from ...	13
... an individual contract and single calculation	3
... an individual contract and profit participation	2
... duration of service and degree of consumption	4
... payment for services and club membership	2
... allowance for utilisation and club membership	2

4. Market development by contracting and institutions (transaction organisations)

Exchange transactions involve costs. The theory of transactions differentiates between costs of initiation, of negotiation, of execution, of control and of adaptation of exchange transactions and contracts. The significance of transaction costs is differentiated according to specificity, to uncertainty and to the frequency of the transaction. Transaction costs are important for the marketability of many goods because of the following reason: In established markets (timber), the exchange partners develop rules of negotiation (General Terms of Trade) and institutions (Tegernseer business usage, arbitration), by which the costs of exchange are reduced. For this reason, on the one hand transactions are facilitated under the same production costs. On the other hand, many products are said to be not marketable, as there are not yet transaction standards for new products.

Thus, in the following project part contractual structures of transactions were documented, sample patterns of contracts were outlined, and the choice of distribution channels evaluated according to transaction costs. In nine case studies, for example, educational events in the forest were documented. The product range comprises canoeing and holidays at the forester's, as well as seminars for executives. Additional benefits prevail in this form of marketing (hunting boxes, guided tours through the forest, firewood, organization). Attractivity and competitive pricing, however, are influenced by so-called forest functions (beauty of the landscape, biodiversity, forest management etc.).

In the structure of contracts, there is a difference between the inner and external relationship. Internally (e.g. forest enterprise, restaurant), contracts to manufacture are closed. Travel contracts are closed with the participants. The consequences for liability and issues of warranty, as well as sample contracts

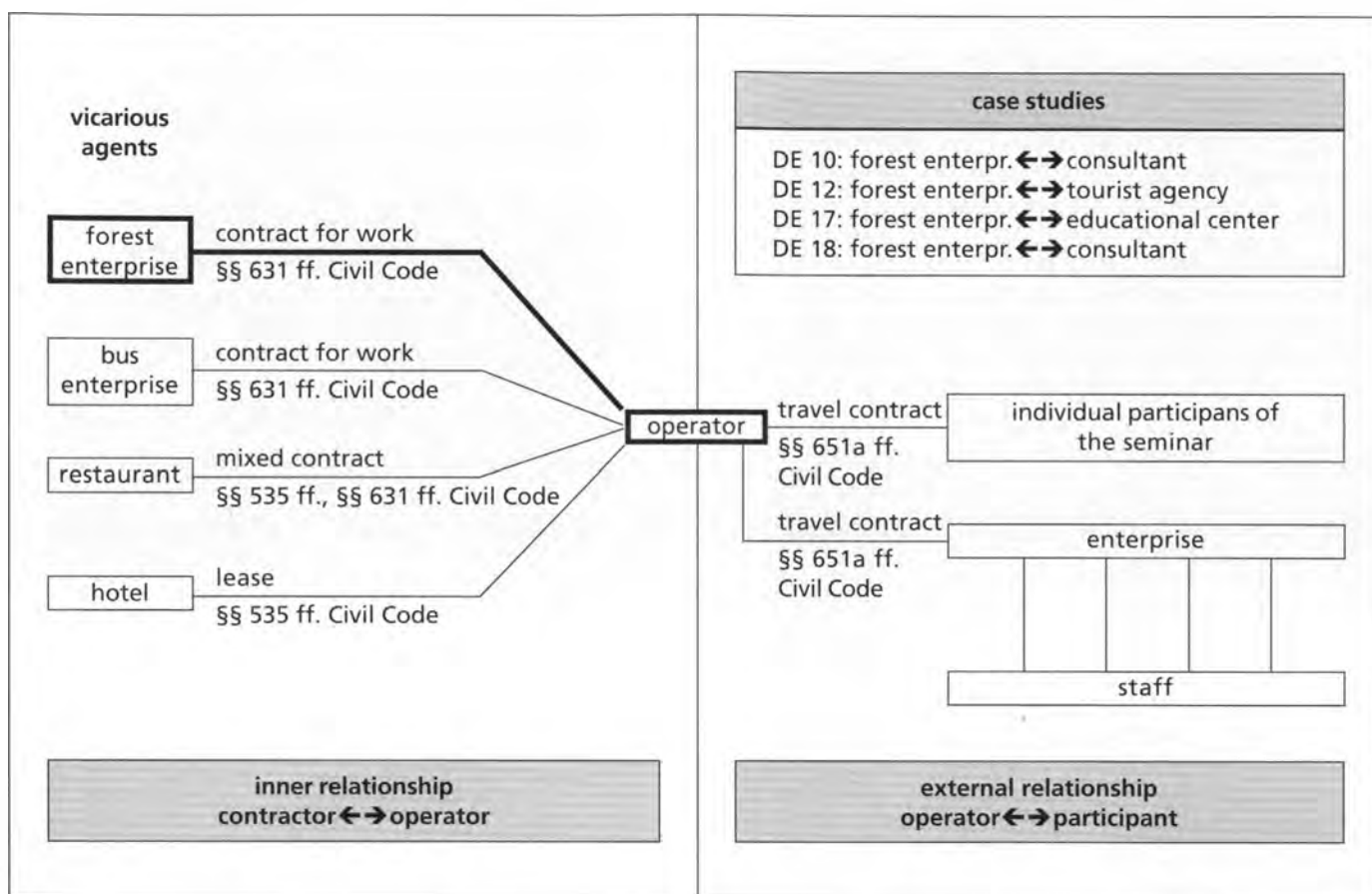


Figure 1: Contractual relations with the offer of seminars

Source: MERTENS, B., in: Beiträge zur Forstpolitik: Siders/Schweiz 99/3, Zürich 1999; RES, S. 19

cannot be outlined in detail here. However, they are very important features of the offer of the forest enterprise.

Subsequently, the issue of organizing the distribution arises. The forest enterprise itself can act as an organizer (direct marketing) or it appoints a third party as

the organizer (intermediary). The assessment of transaction costs provides useful explanation patterns for this matter.

Table 3: Comparison of direct marketing and intermediaries

Source: MERTENS, B., in: Beiträge zur Forstpolitik: Siders/Schweiz 99/3, Zürich 1999; RES, S. 24f

	Direct marketing	Intermediaries
Advantages	Lower costs of control, higher level of confidence	Lower costs of contact, negotiation, and handling costs
Disadvantages	Higher costs of contact	Higher expense with complex products with lower sales frequency
Relevance in transaction	With high transaction-specific investments and great doubts on the side of the consumers	With low transaction-specific investments and low uncertainty of the customers
Examples	Sponsoring contracts, long-term contracts for the supply with electricity and water, market events; christmas trees distributed by special market events (RES-product)	Holiday flats, organic meat, edible chestnuts; christmas trees as mass products (traditional product)

Independent intermediaries reduce the costs of contacting customers, as well as costs of negotiation and settlement. However, they are less suitable for products with high internal complexity and low sales frequency. Therefore, independent intermediaries deal with the letting of holiday flats, the sale of organic meat via the local butcher or the wholesale of edible chestnuts.

If there are high investments required for marketing of this specific kind of transaction and if, moreover, the uncertainty of the consumers is considerable, direct marketing becomes more frequent. The case studies concerning sponsoring products, market events and special seminar offers are examples of this phenomenon.

5. The role of legal framework

A comparison of the legal situation in Austria, Italy, the Netherlands and Germany shows that the right of access to forests is regulated very differently. Even though there are still a number of differences in Germany and Austria, both countries have enacted an explicit right of recreationists to enter the property of third parties. In contrast to the situation in Germany, riding and cycling in Austria is not admitted by law. As the right of access is granted only for recreational purposes, commercial or organized activities are not permitted thereby (Wohanka NuR 1983, 63). In this respect, the same situation as in Germany prevails.

Contrary to this, Italy and the Netherlands do not provide a right of access. In Italy at least a principle – not a subjective right – of access is granted which, however, only refers to state nature reserves. As a consequence, the property rights of landowners are less restricted than in Germany and Austria; the landowner is generally entitled to exclude other people (even though there still might occur some problems of enforcement, in particular in Italy). For Italy, it is difficult to make general statements on the access right, because of the importance of provincial legislation. The Dutch situation is very specific. An access right is not granted to the public. But state subsidies are only paid when the forest owner offers access to the public.

The „access right“ as an example of the „right of action“ is not only limited by national borderlines. Also regional legislation of some states indicates considerable differences concerning the legal status of proprietors. As concerns Germany, there are the following conclusions drawn by MALZBURG:

- The right of access is not a fundamental problem concerning the development of RES-products.
- Due to the public resistance which can be expected and to the general loss of reputation, it is not a sensible political target to be aimed at in the interest of the forest owners.
- But the legislator should specify the right of access with regard to the construction of fences and other types of barriers in context with recreational uses. Insofar, mainly the state legislators are asked to fulfil the legal frame provided by the Federal Forest Act. Thus, the state legislators could specify that fences and even charge of entrance fees may be admissible in the forest when the respective recreational facility or event is offered to the overriding public interest. However, this would still imply that significant impairments of the ecosystem must not be caused. Moreover, it has to be safeguarded that such limitations in favour of local offers of leisure activities do not hollow out the general right of access.
- In respect of the interests of landowners it could be stated that gathering of mushrooms and berries in small amounts is only admitted for free as far as the landowner does not introduce picking-permits. Thus, a forest owner would still be entitled to implement RES-products in this field.

The past development of a number of restrictions on specific recreational activities is quite interesting. Most of these provisions have been passed in recent years due to the increasing demand for recreation of the general public and the various conflicts caused thereby. Even though these provisions are also aimed at the protection of private property, they can impose restrictions on those landowners who want to implement RES-projects. In other words: Until today, RES-products that are implemen-

ted by forest landowners are probably not considered by policy leaders. This congress is a further step to more publicity in this market field.

As legislature, as well as the leading forest theories (forest functions in the wake of wood production), in the past were led by the outdated belief that only timber would provide income, important legal domains already have been interpreted disadvantageously for forest owners. The character of non-marketable goods would already change if the parties would assume a different approach towards forest services as an entity consisting of wood production and recreational and environmental services. As concerns the political framework, the change in approach by all means seems possible, as the results from the following inquiry indicate.

6. The public acceptance story

In cooperation with the Dutch project partners, a representative inquiry was executed interviewing 1,000 German households. The households among other issues were asked to state which of the advantages and benefits of the forest should, in their opinion, be remunerated by the users and which should be financed publicly by taxes or offered by the private forest owners free of charge. A selection of the areas questioned about is indicated in the following table.

1. The households differentiated very much between the different forest uses.
2. Special utilization by individual groups should nearly exclusively be remunerated by the consumers themselves.
3. General recreational facilities (hiking paths) should be provided by the forest owner to satisfy basic demands. However, a duty of national participation is acknowledged which increases when referring to additional values (signposting).
4. In the opinion of the general public, environmental measures increasingly have to be covered publicly, though a contribution of the forest owner is expected.

Therefore, it is necessary to integrate the particular interests of individual groups in a larger context. By this, the

Table 4: Public opinion on source of payments

forest services	financing and payments in % gw				
	no answer	by user	via taxes	by forest owner	don't know
hunting	0,8	81,9	4,4	6,3	6,6
bridle paths	1,3	67,9	8,9	13,8	8,0
walking on forest roads	1,0	4,1	27,7	59,6	7,5
signposting of forest roads	1,7	4,4	60,8	25,3	7,8
dead trees/timber	1,6	3,0	29,3	36,0	30,2
nursing of biotops	1,9	4,5	47,0	31,0	15,6

gw = weighted percentages

universality of interests is limited considerably. Specialized usage, such as bridle-paths, are not expected to be covered by the land owner or by the general public.

7. A Theory for Marketability of Public Goods

The following reflections do not claim to solve all of the marketing problems of public goods provided by the forest. Though, they would facilitate marketing of a by far larger share of forest facilities than is assumed at present. Furthermore, they originate from another theoretical understanding which cannot be outlined here in detail. For a more detailed explanation, please refer to the respective sources. The following four basic components are required for the expansion of the marketability of forest facilities:

I. The design of non-material values can be used for enhancing marketability.

Traditional concepts in forest economy formulate values in the form of forest functions. With their assignment to the wake, at the same time they are withdrawn from the process of marketing. Values, however, can be integrated in the marketing process in different ways:

- Transformation on an already existing tangible product of the own enterprise by trademarks and certificates
- Transformation on an already existing tangible good of another enterprise by sponsoring (illustration 2.1) and licensing of trademarks
- Establishing a product-mix of non-material values and tangible product

characteristics to form products and services

- Convincing customers to pay voluntarily via prices and contributions

II. Markets are complex entities of organization the formation of which has to be shaped, i. e. can be influenced.

The model of a perfect market has left considerable damages to the market economical philosophy.

- Markets are not concentrated but often only result from a suitable network of intermediaries and channels of distribution (seminars for executives).
- Markets often start to function only when institutions of coordination and establishing confidence are established (network of bridle-paths).
- Markets consist of exchange transactions, and exchange transactions in turn require contracts and conditions of sale. Without regulations concerning financing and trade, also the timber trade does not function.
- Markets require a clear, trustworthy legal framework. Forest regulations came into existence under different political framework conditions and require modification. Even more important for forest economy is the circumstance that self-imposed limitations often are not based on a legal background.

The neoclassical concept of a perfect market has inflated the problem of public goods even more by denying the possibility of exerting active influence on markets and their dynamics.

III. Goods display an inner structure of product elements and additional benefits.

In the concept of the structure of a product as a homogeneous unit (black-box-approach), many products do not seem to be marketable. Via the composition of product elements and the targeting towards benefits, exclusiveness and competition of goods and services can be considerably influenced.

- The feature of exclusiveness depends on the level of benefit of a product. In general, exclusiveness increases with the level of benefit. Therefore, exclusiveness cannot be defined for a complex product but only for its elements. Furthermore, it can be influenced by product design.
- Products are generated from a variety of elements. The product character (exclusiveness, competition) of these elements is different. From the variety of elements, marketing possibilities can be developed with the corresponding strategy.
- The value and marketability of a product not only follows from the tangible and non-material offer, but from the strategy by which it is marketed.
- The passive division in marketable and non-marketable goods and services stays far behind the possibilities of marketability of the goods.

IV. The human factor in itself is an important element in the marketability of goods and services.

A lack of marketing of forest products frequently is due to the human factor. From the broad spectrum of the human aspects of marketability, the

most important are the following features:

- New markets and new business fields have to be worked by new, adjusted competences and instruments. In general, enterprises are used to this situation. In the case of forest management and the marketing of recreational and environmental facilities, however, this issue is a grave phenomenon.
- Even if the capacity to act is provided, the willingness to act additionally has to be present. This involves to overcome barriers due to personal (professional training/tradition) and organizational (public forests) reasons. This situation is commonly known to enterprises. Though, this has grave effects on forest management and the marketing of RES-products.
- Each market transaction is related to overhead charges (transaction costs) depending on the enterprise and the product environment, because of initiation, execution and control of market transactions. With lowering these costs (e.g. by sample contracts) marketability rises.
- Market success by far depends on motivation, and therefore on emotions, than it is expected in a branch oriented towards production.
- The basic element of every market transaction is not complete information, but limited information, underlying preferences and emotions. Therefore, subjectivity overrules objectivity. In a competitive situation, often the history of the product has got a higher influence on market success than the product itself. In the ideal case, both aspects match.

By the concept described above concerning the function of values, the structure and design of markets, the product

elements and levels as well as the human factor in the marketing process the degree of exclusiveness and competition of goods and services, can be extended widely.

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Forests as Source of Raw Materials

Tim Rollinson

Abstract

The presentation will set out the recommendations from the Forum held in May at Soltau to consider the growth and supply and the production and utilisation of wood into the next millennium.

The global outlook for the world's forests are for:

- a rising demand for wood and its products
- a declining area of forests available
- an increasing pressure on wood supply
- an increasing opportunity and need to restore deforested and degraded land.
- In order to meet these trends, the Forum recognised the need for:
- strengthened inter-sectoral decision making on land use
- enhanced forest management and plantation establishment
- specific attention to local fuelwood shortages.

The presentation will describe the factors which form the basis of, and the key requirements for, sustainable forest management. It will suggest ways of coping with change – including technological developments – to meet society's economic, environmental and social agenda.

Co-operation among governments and between key stakeholders will be crucial to securing the multiple benefits that forests can deliver.

Transcript of the presentation by Mr. Rollinson based on slides and tapes
Responsible editor: Jutta Poker

I am going to talk to you about the forum that I helped to run in May 1999. We held two workshops which looked at forests as a source of raw materials. The workshops were 'Growth and Supply' and 'Production and Utilisation'. We had about 80 participants from 20 different countries who represented a range of interests including commercial whole salers, forestry policy makers, forest

managers and timber users.

Coming from a country which has cleared almost all of his natural forests, and which has a forest cover (in England) of about 7%, and which is the second largest net importer of wood in the world with imports of about 30 billion DM a year, I am quite well qualified, I think, to talk about wood as a raw material, because we have not got any!

Trends in Forestry Policy

The forum started off by looking at trends in forestry policy. Looking at the early parts of the century, the 1940s and 1950s, the focus was on wood production, growing of trees. During the 1960s a lot of emphasis and research work went into looking at wood quality for the market. In the 1970s, during the 1980s and through to the present days, environmental issues have tended to dominate forestry policy around the world. In the last few years, – and looking forward –, social issues are beginning to dominate forestry policy. That is a personal view, but also one based on looking at trends around the world.

Social issues have always underpinned forestry policy but they have not really been at the forefront of forestry policy. My belief is that they will move very much more to the forefront.

We looked at information on wood use based on the FAO report 'State of the World's Forests'. We noted that the global demand for wood was about 3.5 billion m³ of which over half was for fuelwood while less than half, about 45% is industrial roundwood. Of the wood used for fuelwood, 90% of the demand is in developing countries, mainly for domestic heating and cooking.

We noted some changes in forestry policy beyond the ones mentioned above:

- a tendency for governments to devolve production forestry to the private sector with privatisation in some countries
- a move away from industrial planta-

tion forestry to rural development forestry in some countries

- where industrial plantations are needed for developments to involve farmers and local communities as growers for central processing plants in some countries and
- a world-wide perception that forests are no longer just a national, but a global resource even though national sovereignty over forests has to be respected.

We looked at international developments such as the work of the United Nations Commission on Sustainable Development and the Intergovernmental Forum on Forests. They have given great international attention to the roles and the political institutions that support forests and forestry. They are looking at the need for an international convention or some other instrument for forests similar to the conventions for biodiversity, climate change, desertification and trade in endangered species. We did not discuss whether there should be a convention but we did look at the processes that are in train to seek criteria and indicators for sustainable forest management. There are many global processes going on which will be familiar to you all like the Helsinki process, the Montreal process, as well as market instruments including certification.

Global Outlook

We discussed the global outlook and identified four key elements:

- rising demand for wood and its products globally, but
- declining area of forest available
- increasing pressure on wood supply by demands for non-wood benefits and products from forests, environmental and social benefits, and
- increasing opportunity and a need to restore de-forested and degraded land.

In order to meet these trends our forum recognised the need for

- strengthened inter-sectoral decision making on land use (but we did not come up with strategies for realisation)
- enhanced forest management and plantation establishment and
- specific attention to local fuelwood shortages.

We recognised four groups of factors which underpin the basis for sustainable forest management:

- recognition and valuation of economic, environmental and social benefits of forests
- This has been a theme of all the forums. Those issues keep coming up and so they should, but we also recognised the need
- (and the difficulty) of balancing or trading-off the different types of benefits, a process of optimisation of sustainable forest management
- to integrate production, processing and marketing of products and
- of complementarity between natural, secondary and plantation forest.

We cannot ignore these interactions at the global level and the key issue arising out of all this is: How do we make forest work to meet society's needs?

Why does it matter? We recognised that wood itself is a primary need of today and tomorrow. Sustainable forest management includes the production of wood for five key reasons:

- inter-generational justice: crucially, future generations must have the resources available to them for their own development and their own decision making. I believe that in the forestry sector we are in a more or less unique position to pass on, if we wish to, something better than we inherited
- But are we capable of this against the demands of meeting the needs of growing human populations,
- meeting changing and growing cultural demands,
- meeting increasing energy demands including
- the substitution of non renewable resources and the substitution of non renewable construction products such as aluminium and steel?

We recognised of course that some areas of the world are in surplus such as parts of Northern Europe, but they are often far removed from areas of deficit.

In order to identify future needs we looked at the need for intensification of integrated management including improved management of natural forests, secondary forests and plantations together with the creation of new woodlands.

We recognised the need to integrate forest management with the production and use of all forest products and there was strong support for close-to-nature silviculture.

Underlying Requirements of Sustainable Forest Management

But underlying sustainable forest management was

- political will and co-operation with environmental and social non-governmental organisations and industry
- again a key requirement for sustainable forest management is appropriate forest education, research and extension services.
- people's participation in planning, managing and benefiting from forests
- appropriate institutional framework, i.e. law, tenure, tax and so on and
- improved information on the extent, the quality, the value, the management, the use and the conservation of forests.

So, improved information came out as key. Getting people to understand the value of the forests is all very well but the above list looks rather like a top-down list of imposing something on people and society rather than a participative list. What is needed is an *inclusive approach*.

How to Meet Needs

The improved management of all types of forests was crucial as well as the creation of new woodlands, integrated use, and close-to-nature forestry. We did identify some solutions. With specific reference to harvesting and utilisation of forest products, we looked at

- the need to increase the efficiency of logging, transport and conversion
- the use and preservation of wood
- replacement of preservatives by new construction techniques
- new designs for wooden structures
- the enhanced efficiency of energy production
- the development of recycling
- the re-use and closed-cycle conversion systems.

There are technical and research solutions to some of the problems!

Coping with Change

We looked at needs and demands and we wondered how to cope with change. We saw huge changes taking place in the types and availability of wood products. Changing availabilities from old trees of the natural forests to the young trees of plantations and with that a changing size from large trees to small trees.

This all puts increasing pressure on policy makers to incorporate not only technical changes but also to take account of the environmental and social agenda. All of this can be described as an *agenda for change*.

We were looking at the needs to improve performance to cope with the changes in order to develop the new solutions: the search for solutions and the search for sustainable forest management. We recognised that in marked contrast to agriculture or other land uses forests and forestry offers multiple economic, environmental and social benefits. Forestry is a unique productive industry because the production unit is an ecosystem with all its components and inter-linkages. We can intensify production without necessarily compromising all of the other benefits. But we need to rationalise the decisions we take between financial maximisation and the social and environmental optimisation.

Conclusion

Crucially, what came out of the forum was the whole theme of co-operation. The world's forests and forest products may be fundamental to a country or to an individual company in terms of its competitive economic performance. There are still great advantages for collaboration and co-operation in research and development, harvesting and processing and other areas. Co-operation is needed between

- governments
- government – private owners – NGOs – rural people
- forest managers – industry and consumers
- scientists to ensure that we have good information processes between policy makers and educators; we need to understand and to com-

■ communicate the values of our forests
■ we need co-operation between institutions through appropriate technology transfer.

That was the main conclusion from the forum and my conclusion here is to say that we not only need to change the image of forestry so that people understand what we are about, but we also need to change the practice. The for-

estry industry and foresters themselves need to start to look outwards to the needs of society and not inwards to the need of their sector.

We know that the world needs wood and we know that wood is good. The world needs forests, it needs our products. My view is that foresters must stop trying to educate the public and start listening to the public. We talk a lot

about society's needs but do we know and understand what they are? That is why we have to listen.

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Wood as a Natural Resource – Innovative Design for Chemical Products as a Contribution to Sustainable Development

Gunter Weber

Abstract

With its contribution "Forests as a natural resource – an innovative design for chemical products" the chemical industry is emphasising that forests are not only a raw material used predominantly as a building material or paper-making pulp, but they also provide the chemical conversion pulp which is a significant starting material for developing chemical products.

The demand for chemical conversion pulp accounts for a mere 0.1% of the renewable resource wood. Based on the principle of sustainable development and the objectives of "Responsible Care" in the chemical industry, the paper describes the value added chain from the manufacture of chemical pulp, its derivatisation and regeneration to chemical products.

After the decline in pulp production in Western Europe, the production volume is expected to rise again in the future due to innovative developments in the wood-pulping process, in cellulose etherification and esterrification thanks to new products and methods.

The challenge ensues from the obligation to conserve resources when utilising energies and to reduce waste and emissions.

The cellulosic products produced on an industrial scale make use of nature's efficiency of synthesis; they satisfy the requirements in terms of sustainable development, and they are highly effective in their respective applications. New product developments in the field of water-soluble and organosoluble cellulose derivatives as well as in the new materials sector help exploit the growth potentials by innovatively expanding the chemicals business involving wood as the source of raw material.

These goals require research and development in the relevant industrial and scientific fields. The development schemes devised by the German Federal Government in conjunction with the renewable resource agency "Fachagentur Nachwachsende Rohstoffe e.V." provide support for the ongoing development of chemical utilisation of cellulose.

The consolidation of Wolff Walsrode's industrial site as a competence

centre for cellulose chemistry has been continued through the investment in a polysaccharide pilot facility.

Holz als Rohstoffquelle – Innovatives Design für chemische Produkte, als ein Beitrag für Nachhaltige Entwicklung

1. Einführung

1.1 Hintergrund

Ein Umdenken in Gebrauch und Verbrauch von Produkten findet vor dem Hintergrund sich wandelnder globaler Herausforderungen statt:

- Begrenztheit natürlicher Ressourcen
- begrenzter Belastbarkeit von Ökosystemen
- Wachstum der Weltbevölkerung
- Unterversorgung großer Teile der Weltbevölkerung

Dies führt zu Konsequenzen:

- Wandel der gesellschaftlichen Werte
- weitere Ressourcenverknappung
- weitergehende technologisch-ökonomische Verflechtung der Wirtschaftsstrukturen
- Neuverteilung der gesamtgesellschaftlichen Kosten

1.2 Kriterien für Nachhaltige Entwicklung

Auf der ersten internationalen Umweltschutzkonferenz in Rio 1992, wurde das Leitbild einer nachhaltigen und zukunftsverträglichen Entwicklung (Sustainable Development) von 178 Nationen verabschiedet. Die Leitvorstellung für eine wirtschaftliche Entwicklung zur Lösung der globalen Probleme verlangt, dass die begrenzten natürlichen Ressourcen so sparsam und effizient ge-

nutzt werden, dass unsere heutigen Bedürfnisse erfüllt werden können, ohne dass zukünftige Generationen in Entwicklungsoptionen beeinträchtigt werden. Kriterien für eine Nachhaltige Entwicklung sind:

- Verringerung des spezifischen Energieverbrauchs bei Herstellung, Verarbeitung und Nutzung
- sparsamer Einsatz von nichterneuer-

baren Ressourcen und verstärkter Einsatz von erneuerbaren Ressourcen nur so weit, wie sie weitergebildet werden

- keine gesundheits- und umweltschädlichen Stoffe, wenn sie offen in die Umwelt eingetragen werden
- Wiederverwendung oder -verwertung nach dem Gebrauch (Quelle: IGBCE)

1.3 Schritte zur "Nachhaltigen Entwicklung"

Die Umsetzung dieses Leitbildes bedingt, dass ökonomische, ökologische und soziale Ziele miteinander verknüpft und ausgewogen werden müssen. Die chemische Industrie trägt zu jeder dieser drei Komponenten bei (Abb. 1).

Ökonomie

- Entwicklung und Markteinführung von innovativen Produkten
- Verbesserung der Wertschöpfung und Produktivität
- Lizenzgebühren auf technische/logistische Verfahren
- Weltweiter effizienter Technologie-Transfer, international gleichwertige Standards



Ökologie

- Optimales Rohstoff-/Energiemanagement
- Integrierter Umweltschutz in der Produktion
- Kontinuierliche Stoff- und Produktüberwachung
- Verstärkter Einsatz erneuerbarer Materialien

Gesellschaft/Soziales

- Soziale Systeme entlasten durch sichere Verfahren, Produkte und Dienstleistungen
- Erhalt von Lebensstandards und Wohlstand durch Produkte und Dienstleistungen
- Hoher Gebrauchsnutzen der Produkte und hohe Nützlichkeit der Dienstleistungen
- Transparente Information der Verbraucher bzw. Öffentlichkeit

Abb. 1: Verknüpfung von Nachhaltigkeitszielen

Tab. 1: Bedeutung nachwachsender Rohstoffe für die chemische Industrie (Stand: Deutschland (West) 1990)

Rohstoff	Mio t	→	Produkt	%
Erdöl	13,0		Fette/Öle	53
Erdgas	2,7		Stärke	28
Nachwachsende Rohstoffe	1,7		Cellulose	17
Kohle	1,5			

1.4 Nachwachsende Rohstoffe

Durch den Siegeszug der Erdölchemie (Petrochemie) verloren pflanzliche und tierische Produkte ihre frühere Bedeutung für die chemische Industrie (Tab. 1). Heute beobachten wir eine Trendumkehr.

Synthese-Argumentation

- Schonung fossiler Rohstoffe
- Anwendung eines CO₂-verbrauchenden Synthese-Prinzips

Struktur-Wirkungs-Argumentation

- Weitgehende Nutzung der Syntheseleistung der Natur
- Hohe Wirkung in der Anwendung durch Regenerate und maßgeschneiderte Derivatisierung

Etwa 10 % des Rohstoffbedarfs in der deutschen chemischen Industrie wird durch nachwachsende Rohstoffe gedeckt. Etwa 10 % davon macht die Cellulose als Rohstoffquelle aus, die überwiegend aus dem Holz gewonnen wird. Wenn der Cellulosechemie heute im Rahmen der industriellen wie wissenschaftlichen Forschung wieder mehr Aufmerksamkeit geschenkt wird, sind dafür folgende Gründe zu nennen:

Abb. 2: Cellulosechemie gewinnt wieder mehr an Aufmerksamkeit

1.5 Wertschöpfungskette Holz als Rohstoffquelle für chemische Produkte

Holz als Rohstoffquelle ist für die chemische Industrie ein Innovationspotential, weil die von der Natur erbrachte Syntheseleistung in Produkte mit hoher Wirkung umgesetzt werden kann (Abb. 3).

Besonders für die Verbesserung der Struktur-Wirkungsbeziehung der chemischen Produkte wird ein innovatives Produkt- und Verfahrensdiseign gefordert.

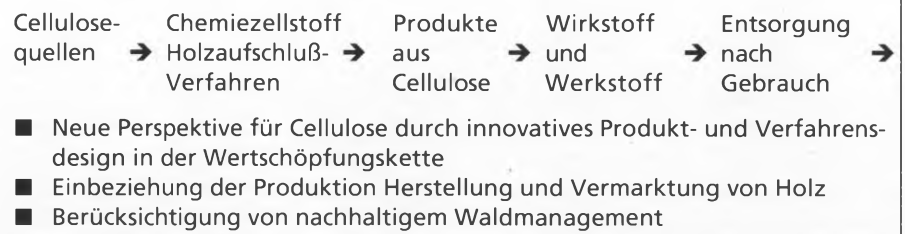


Abb. 3: Wertschöpfungskette Holz als Rohstoffquelle für chemische Produkte
Sustainable Development betrifft dabei die ganze Kette der Wertschöpfung und den gesamten Lebensweg der Produkte

2. Cellulosequellen

Der für die industrielle Erzeugung von Chemiezellstoffen dominierende Rohstoff ist Holz.

Tab. 2: Holzprodukte weltweit, Stand und Aussichten der weltweiten Chemiezellstoff-Produktion

(* Quelle: Patt et al., Das Papier, 12/97, 637-643)

Wald Produkt	%		Cellulose verarbeitet in	%	Produktion von Chemiezellstoffen aus Holz*	
Brennstoff	45		Papierindustrie	>96	Jahr	t p.a.
Möbel	34		Chem. Industrie	< 4	1978	4,8 10 ⁶
Zellstoff	10				1996	2,8 10 ⁶
Baustoff	8				~2005	3,7 10 ⁶
Cellulose t p.a.	1,7 10 ⁹	7 10 ⁶ Baumwolle	140 10 ⁶			

Etwa 10 % der jährlichen Waldproduktion wird für die Herstellung von Zellstoffen verwendet. Der Anteil an Chemiezellstoff ist mit <4 % im Vergleich zum Papierzellstoff sehr klein. Die aus Chemiezellstoff erzeugten Produkte hatten 1978 einen Höchststand von ca. 5 Mio to. Die Weltchemiezellstoff-Produktion beträgt heute ca. 3 Mio to. In Zukunft rechnet man wieder mit zunehmenden Produktionsmengen aufgrund innovativer Produkt- und Verfahrensentwicklungen und steigendem Bedarf. Insgesamt macht der Bedarf an Chemiezellstoff nur etwa 0,2 % an der jährlich genutzten Waldholzmenge aus.

Zu über 90 % basiert die Chemiezellstoffproduktion auf dem Einsatz von Laubhölzern (z. B. Eukalyptus, Akazie, Buche) und Nadelhölzern (z. B. Southern Pine, Kiefer, Fichte) (Tab. 3).

Einjahrespflanzen haben eine untergeordnete Rolle. Bei den non wood-Rohstoffen wird nur Linters in nennenswerten Mengen zur Herstellung von

Chemiezellstoffen eingesetzt. Der Vorteil von Baumwoll-Linters ist der hohe a-Cellulosegehalt von 98%; der Nachteil ist ein hoher und abhängig von der Baumwollernte stark schwankender Rohstoffpreis.

Der Anteil an Laub- und Nadelholz-zellstoff an der Chemiezellstoffproduktion hat sich in den letzten Jahre geändert (Abb. 4):

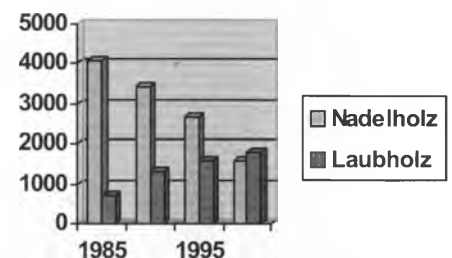


Abb. 4: Anteil an Laub- und Nadelholz-zellstoff an der Chemiezellstoffproduktion in 1000 t/a (Quelle: Kordsachia et al., Das Papier, 2/99, 96-108)

Tab. 3: Industrielle Rohstoffe für die Herstellung von Chemiezellstoffen
(Quelle: Kordsachia et al., Das Papier, 2/99, 96-108)

Nadelhölzer	Laubhölzer	Nonwood-Rohstoffe
Southern Pine	Eukalyptus	Baumwoll-Linters
Kiefer	Akazie	Bambus
Fichte	Buche	Zuckerrohr-Bagasse
Tanne	Birke	Stroh
Hemlock	Eiche	Synthese durch Bakterien
Lärche	Pappel	

Nadelholzzellstoffe werden sukzessive durch Laubholzzellstoffe substituiert. Der Anteil an aus Laubholz hergestellten Holzchemiezellstoffen lag im Jahr 1985 noch deutlich unter 20 %.

Der Ausbau der Produktionskapazitäten für Eukalyptus Chemiezellstoffe einerseits und die Schließung, Umstellung oder geringe Kapazitätsausstattung von Nadelholz verarbeitenden Chemiezellstoffwerken - gerade in den letzten Jahren - haben jedoch dazu geführt, dass nun mehr Laub- als Nadelhölzer für die Produktion von Chemiezellstoffen eingesetzt werden. Der niedrigere Preis von Laubholz gegenüber Nadelholz einerseits und die gute Eignung für die Chemiezellstoffherzeugung andererseits sind Gründe hierfür.

3. Chemiezellstoff – Holzaufschlußverfahren

3.1 Umfeld

3.1.1 Importabhängigkeit

Die Rohstoffversorgung der Chemiezellstoff verarbeitenden Unternehmen in Deutschland wird ausschließlich aus ausländischen, vorzugsweise aus außer-europäischen Quellen gespeist. Es besteht eine Abhängigkeit beim Chemiezellstoff, die größer als beim Papier ist, da hierfür ca. 17 % des Zellstoffbedarfs (700.000 t) aus inländischer Produktion kommen.

3.1.2 Holzreserven

Die Waldfläche in Deutschland beträgt ca. 30 % an der gesamten Fläche. Die Forstwirtschaft findet nicht genügend Abnehmer für das einheimische Holz, was sicherlich auch mit dem geringen Bedarf der papiererzeugenden Industrie zusammenhängt, die zu einem erheblichen Anteil ca. 60 % Altpapier einsetzt.

3.1.3 Industrielle Randbedingungen

Die Erzeugung von Chemiezellstoffen verlangt größere Anstrengungen als die Papierproduktion. Mengenmäßig bildet der Chemiezellstoff nur einen Anteil von 3 % an der Gesamtproduktion einer Zellstofffabrik. Zudem stellt die Erzeugung von Chemiezellstoffen viel größere Anforderungen an die Reinheit und an die Einhaltung der vom Chemiezellstoffverarbeiter verlangten Spezifikationen.

3.2 Qualitätsanforderungen

Wesentliche Qualitätsanforderungen an Chemiezellstoff sind

- hoher α -Cellulosegehalt
- gleichmäßige, auf bestimmte Werte eingestellte Viskosität
- hoher Weißgrad
- niedriger Aschegehalt
- geringer Extraktstoffgehalt

3.3 Holzaufschlußverfahren

Für die Herstellung von Chemiezellstoffen unter Verwendung von Holz als Rohstoff werden heute nur das Vorhydrolyse-Sulfatverfahren (VS) und das saure Sulfatverfahren industriell angewandt.

Das Sulfatverfahren hat mit knapp 60 % Anteil an der aktuellen Jahresproduktion seine führende Position bei der Erzeugung von Holzchemiezellstoffen behauptet. Das VH-Sulfatverfahren hat aber an Bedeutung gewonnen. Mit zunehmender Nutzung von Laubhölzern ist zu erwarten, dass das Sulfatverfahren in absehbarer Zukunft auch in der Chemiezellstoffproduktion die Führung übernimmt, wie dies bei der Erzeugung von Papierzellstoffen schon der Fall ist.

3.4 Nachteile der klassischen Verfahren

Die hauptsächlichen Nachteile in der klassischen Zellstoffherstellung sind die hohen Betriebskosten und der hohe spezifische Investitionsaufwand.

Die Wirtschaftlichkeit von Sulfatzellstofffabriken ist bei Neuinvestition erst ab Anlagengrößen von größer 200 kto aufwärts geleistet. Das spezifische Inve-

stitionsvolumen für Anlagen mit einer Kapazität von 200 kto liegt bei etwa 3,5 bis 4 TDM/jato, bei Anlagen mit einer Kapazität von 500 kto etwa bei 2,5 TDM/jato. Dies sind Größenordnungen, die in vielen Ländern nicht zu realisieren sind.

Die in den letzten Jahren fortschreitende Stilllegung von Zellstoffbetrieben in Deutschland ist in den strengen Umweltvorschriften zu finden. Große Mengen an Wasser und Chemikalien sind erforderlich für die klassischen Verfahren der Zellstoffherzeugung. Bei hohen Zellstoffqualitäten entstehen umweltbelastende Abwasser. Die Nebenprodukte sind nicht wirtschaftlich nutzbar als Verkaufsprodukte.

3.5 Entwicklung eines neuen Holzaufschlußverfahrens (Steam Explosion)

Eine Kopplung von Zellstoffherzeugung und direkter Weiterverarbeitung zu entsprechenden Cellulosederivaten/-regeneraten soll ein neues Holzaufschlußverfahren ermöglichen: Das Steam Explosion-Verfahren, bei dem Wasserdampf zum Aufschluß eingesetzt und unter explosionsartiger Entspannung die Zugänglichkeit für den Aufschlußprozess fördert (Abb. 5).

Im Rahmen des Förderprogrammes "Nachwachsende Rohstoffe" hat sich der Fachausschuß Nachwachsende Rohstoffe im Verband der Chemischen Industrie für die Bearbeitung dieses Pilotprojektes ausgesprochen. Beteiligt sind die Firmen Rhodia, Accordis, Clariant und Wolff Walsrode im Zusammenschluß mit

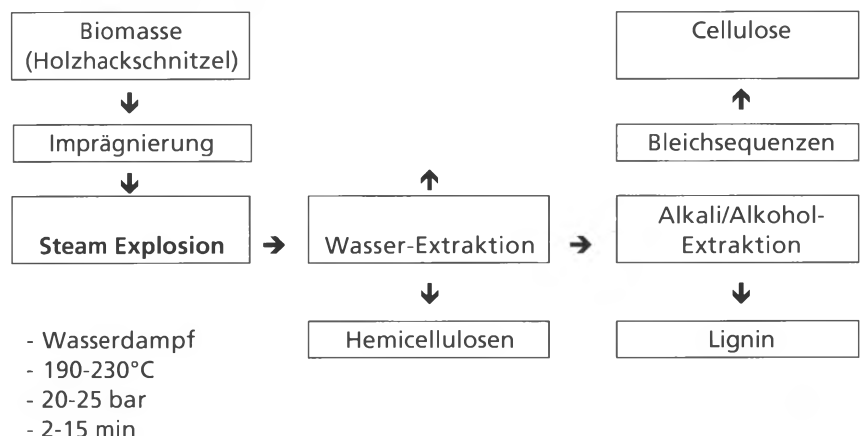


Abb. 5: Neues Aufschlußverfahren für Holz – Steam Explosion

wissenschaftlichen Instituten. Ziel ist die Gewinnung von Chemiezellstoff mit verbesserter Versorgungssicherheit, Ökonomie und Ökologie (Tab. 4):

4. Produkte aus Cellulose

Die aus der Cellulose gefertigten Endprodukte lassen sich in 4 Hauptgruppen einteilen

- Native (fibres, paper, cardboard)
- Regenerate (derivate: fibres, films, casings)
- Ester Derivate (inorganic: NC; organic: CA, CAB, CAP)
- Ether Derivate (anionic: CMC; non-ionic: EC, MC, HEC, FPC)

In der jährlichen Herstellung überwiegen die Regenerate der Cellulose (ca. 65 %, 3,2 10⁶ t weltweit), gefolgt von den Celluloseestern (1,25 10⁶ t weltweit). Die kleinste Menge stellen bislang die Celluloseether dar (Carboxymethylcellulose 0,25 10⁶ t, Methylcellulose 0,1 10⁶ t, Hydroxyethylcellulose 0,07 10⁶ t, sonstige Celluloseether 0,02 10⁶ t).

4.1 Regenerate der Cellulose

Die Verarbeitung der Cellulose in Form von Regenerationsprozessen ist in jedem Fall mit erheblichen chemisch-energetischem Aufwand verbunden, der durch die physikochemischen Voraussetzungen des Biopolymer bedingt wird.

Von diesem Einsatz findet sich – außer morphologischer Veränderungen – nichts im Endprodukt wieder. Im Sinne einer ökonomisch-ökologischen Prozeßoptimierung ist es daher notwendig, die zur Solvataion eingesetzten Chemikalien möglichst quantitativ zu recyclieren.

Auch dieser Schritt stellt sich energetisch immer aufwendig dar, weil die Rückgewinnung aus großer Verdünnung zu erfolgen hat. Von allen Verfahren sind bislang für die Industrieproduktion der Viskoseprozeß relevant. Die Nachteile des Viskoseprozesses sind:

- Auflösen der Cellulose mit der Umsetzung zum Xanthogenat erfordert lange Aufschlußzeit (40 – 60 h für Nachreife der Viskose)
- Geringe Cellulose-Konzentration in der Viskose (ca. 9%)
- Beim Füllen der Viskoselösung in saures Fällbad entstehen umweltbelastende schwefelhaltige Gase → Betriebskosten für biologische Abluftreinigungsanlage

Tab. 4: Steam Explosion

Anwendung:	Vorteile:	Marktdaten:
<ul style="list-style-type: none"> – Gewinnung von Chemiezellstoff mit verbesserter Versorgungssicherheit, Ökonomie und Ökologie 	<ul style="list-style-type: none"> – verringerter Energiebedarf und – verringerter Chemikalieneinsatz durch never dried pulp – geringere Importabhängigkeit – dezentrale Erzeugung und Rückwärtsintegration – verbesserte Lösungseigenschaften der Derivate – höhere Reagenzausbeuten bei Derivatisierungen – geringere Abwasserbelastung 	<ul style="list-style-type: none"> – Verfahren zielt auf den gesamten Markt

- Teuer rückgewinnbare Nebenprodukte

Auf dem Gebiet der chemisch-technischen Celluloseverarbeitung und der man-made Cellulosematerialien sind gegenwärtig große Anstrengungen und bemerkenswerte Fortschritte zu verzeichnen. Von allen technischen Verfahren ist das Aminoxidverfahren zu nennen, bei der die Cellulose ohne Derivatisierung direkt in eine Lösung überführt wird und aus dem Lösungszustand direkt weiterverarbeitet werden kann. Diese Verformung von Cellulose aus einer N-Methylmorpholin-N-oxid (NMMNO)-Lösung ist eine umweltfreundliche und flexible Alternative zum Viskoseprozeß:

- Polymerisationsgrad (DP) kann maßgeschneidert eingestellt werden (Vorhydrolyse, Bleiche)
- Fällprozess in Wasser ohne Salzbildung (→ umweltschonend)
- Fällbad kreislauffähig

Es gibt nun neue Möglichkeiten der Herstellung von Cellulosefasern und -folien aus dem NMMNO-Verfahren. Aus der Lösung können beliebige Formkörper mit hervorragendem Eigenschaftsprofil hergestellt werden. Dies eröffnet Perspektiven für:

- Filamentgarne
- Stapelfasern für textilen Einsatz Tencel®, Lyocell®
- Folienherstellung durch Gießen (alt Cellophan) und Blasfolienextrusion

- Herstellung von Wursthüllen, Membranen

Das Verfahren tritt zunehmend in Konkurrenz zum über 100 Jahre altem Viskoseverfahren.

4.2 Celluloseether

Celluloseether werden seit ca. 60 Jahren industriell hergestellt, nachdem sie vor über 90 Jahren zum ersten Mal beschrieben worden sind. Ziel der Celluloseveretherung ist die Wasserlöslichkeit der Cellulose, die durch den Einbau von Substituenten an der Anhydroglukoseeinheit des Cellulosemoleküls erreicht wird

Grosstechnisch stehen vier Reagenzien zur Verfügung, die den Produkten unterschiedliche Eigenschaften verleihen und ihre Wirkung in der Anwendung ausmachen.

- Natronlauge zum Chemiezelluloseaufschluss und als Reaktionspartner
- Methylchlorid für Methylcellulose (MC)
- Ethylenoxid und Propylenoxid für MHEC bzw. MHPC
- Monochloressigsäure für Carboxymethylcellulose (CMC)

Die Herstellverfahren sind auf die unterschiedlichen Typen optimiert. Die Gemeinsamkeiten in den Prozessschritten umfassen

- Chemiezellstoffmahlung
- Aktivierung mit wässriger Natron-

lauge und anschließender Veretherung in einem Mehrphasensystem

- Neutralisation der nicht verbrauchten Natronlauge und Wäsche
- Mahlung und Trocknung

Durch ständige Produkt- und Verfahrensverbesserungen wurde das Eigenschaftsprofil der Celluloseether gezielt auf den Anwendungsbereich eingestellt, die Wirtschaftlichkeit in der Herstellung verbessert und durch Klärung der Abwässer die spezifische Belastung (CSB) reduziert.

Die Anwendungen zielen auf die Märkte:

- Baustoffwerkstoffe, wie mineralische Putze, Fliesenkleber
- Dispersionsfarben
- Papier
- Textil
- Kosmetik
- Pharma
- Erdölförderung

Sie betreffen die wichtigen Lebensbereiche Bau und Wohnen sowie Gesundheit und Ernährung.

4.3 Celluloseester

Cellulosenitrat oft als Nitrocellulose bezeichnet ist der wichtigste anorganische Ester der Cellulose und schon seit über 150 Jahren bekannt. Das nitrierende Agens ist das aus Wasser, Salpetersäure und Schwefelsäure bestehende Nitriersäuregemisch. Durch Variation des Nitriersäuregemisches kann der gewünschte Veresterungsgrad eingestellt werden.

Das Herstellverfahren beinhaltet die Schritte

- Chemiezellstoffmahlung
- Nitrierung, Druckkochung und Wäsche
- Konfektionierung (wasserfeucht, alkoholfreucht, weichmacherhaltige Chips)

Durch die Höhe der Substitution der Anhydroglykoseeinheiten des Cellulosemoleküls werden die anwendungstechnischen Eigenschaften der Lacke (organolöslich, filmbildend mit harter Oberfläche, gut mischbar mit anderen Lackrohstoffen, schnell trocknend, Anfeuerung) bestimmt. Die Einsatzgebiete der Nitrocellulose in der industriellen Anwendung sind wegen der guten Filmbildungseigenschaft die Lack- und Druckfarbenindustrie.

Verfahrensverbesserungen im Sinne des integrierten Umweltschutzes bei der Nitrierung und der Kreislaufführung der Nitriersäure zielen auf eine Erhöhung der Ausbeute und einer Verringerung der Abwasserbelastung betreffend Nitrat und Sulfat. Durch zusätzliche Massnahmen im Bereich der biologischen Abwasseraufbereitung wird der Abbau von Nitraten deutlich verbessert.

4.4 Neue Werkstoffe

Nachwachsende Rohstoffe erfüllen die Forderung nach Umweltverträglichkeit im Sinne eines biologischen Kreislaufes in sich. Die Veränderung der molekularen Struktur des Biomoleküls zum

Die Forschungsaktivitäten zielen im Hause Wolff Walsrode auf den Einsatz als Werkstoff, in der Papierverleimung und anderen Anwendungen hin.

5. Wachstumspotentiale durch Innovationen

Innovationen betreiben, heißt etwas Neues in der unsicheren Zukunft zum Erfolg bringen.

Die Schwierigkeit liegt nicht so sehr in dem Mangel an neuen Ideen, sondern an dem Verlassen der alten. Um neue Wege gehen zu können hat die Wolff Walsrode AG ein neues Polysaccharid-Technikum gebaut und diese in diesem Jahr in Betrieb genommen:

Tab. 5: Neues Polysaccharid-Technikum bei WWAG – Grundlage für Innovation

Aufgaben	Möglichkeiten
<ul style="list-style-type: none"> ■ Entwicklung neuer Produkte ■ Optimierung bestehender und Entwicklung neuer Verfahren ■ Mengen im 40-120 kg Maßstab 	<ul style="list-style-type: none"> ■ Synthese von Polysaccharid-Derivaten, Separation, Wäsche und Konfektionierung ■ Stoffkreisläufe

Zwecke der wirtschaftlichen Herstellbarkeit (Prozessfähigkeit) und anwendungstechnischen Eigenschaften mit Kundennutzen geht in der Regel mit einem Verlust an biologischer Abbaubarkeit einher.

Die Vereinigung von thermoplastischer, also in der Wärme frei formbarer Verarbeitung wie der Extrusion von Folien oder der Herstellung von Fertigteilen durch Spritzgießen und biologischer Abbaubarkeit ergibt im Fall der Cellulose eine scheinbar nicht zu verknüpfende Eigenschaftskombination. Eine neue Stoffklasse von Cellulosederivaten erfüllt diese Eigenschaftskombination.

Durch Separation der Cellulosehauptketten in einem geringen Ausmass mit biologisch abbaubaren Seitenketten aus Polymilchsäure und geringer Hydrophobierung der Cellulosemoleküle durch Veretherung entsteht das Hydroxypropylcelluloseelactat (HPCL). Das Produkt hat Eigenschaften wie ein steifer Thermoplast (z. B. Polystyrol), ist thermoplastisch und wird durch Bakterien und Pilze mikrobiell zu CO₂, Biomasse und Wasser umgesetzt.

6. Resümee

Damit das Wachstumspotential des Chemiegeschäfts mit Holz als Rohstoffquelle innovativ ausgebaut werden kann, müssen folgende Ziele strategisch verfolgt werden:

- Berücksichtigung der nachhaltigen Waldwirtschaft
- Verminderung von Abfällen, Energie und Wasser in der Chemiezellstoffherstellung
- Verfügbarkeit von Chemiezellstoffen mit hoher, gleichbleibender Qualität
- Entwicklung und Ausbau des Chemie-Geschäfts mit Ausdehnung in bestehenden Anwendungen und neuen Märkten orientiert am Leitbild der Nachhaltigen Entwicklung. Die Nachhaltige Entwicklung stellt sich als ein komplexer Prozess für die Langlebigkeit und Gesundheit der ökonomischen, ökologischen und sozialen Systeme dar.

Am Beispiel der Wechselbeziehung Wald und Gesellschaft wird bewusst, dass nur ein integrativer Ansatz unter Einbindung von Politik, Gesellschaft, Wissenschaft und Wirtschaft einen ge-

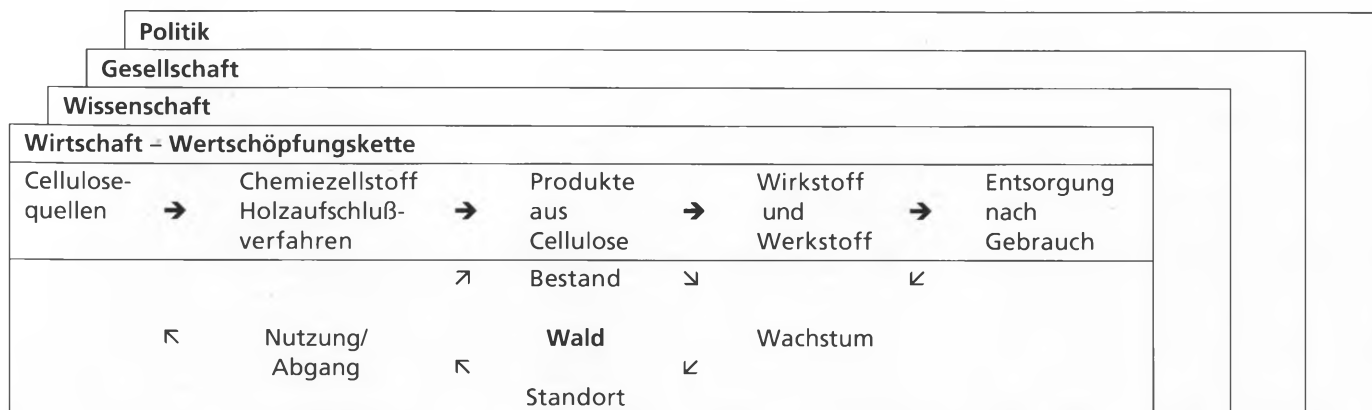


Abb. 6: Integrativer Ansatz als Weg zum verantwortlichen Handeln für Nachhaltige Entwicklung von Wald und Gesellschaft

eigneten Weg darstellt, um den Bedarf der Industrie nach Chemiezellstoff aus der Rohstoffquelle Wald zur Herstellung von chemischen Produkten mit hohem Kundennutzen unter den Aspekten Nutzung, Bestand, Wachstum und Standort

des Waldes in Einklang bringen kann. Die Instrumente zur Steuerung dieser gegenseitigen Abhängigkeiten ergeben sich aus einem Suchprozess auf dem Weg des Verantwortlichen Handelns (responsible care) .

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Forestry at the Turn of the Millennium: Challenges Ahead

Wulf Killmann

1. Introduction

During the past 20 years, traditional ways of forest utilization have come under scrutiny. Concerns have focused particularly, though not exclusively, on the tropics. The public, particularly in the developed world, has become increasingly concerned at reports of forest degradation and destruction through conversion of forests to agricultural land, need for fuelwood, and increased supplies to timber markets. International and national NGOs have played a crucial role in alerting the public to the importance and magnitude of some problems. Forestry issues, previously limited to the "greens", have entered the concern of the international community. The "sustainability" of forest opera-

tions, coined as "Nachhaltigkeit" in Germany by the Saxon von Carlowitz as early as 1714, has become a new international catchword. Concern has increased about the sustainable management of forests, particularly in the tropics, as well as about preservation of biodiversity, clean air and clean water. This intensified awareness has resulted in, amongst others, a North-South polarization and the boycott of tropical timber in some European and North American markets. The international community has reacted with increased research on these subjects, expert consultations, conferences and meetings at various levels, and the signature and ratification of a number of legally binding instruments and conventions.

2. Where are we?

2.1 At the international level

2.1.1 UNCED in Rio de Janeiro

It has become increasingly obvious that environmental issues and those of society's development are interconnected. This linkage was particularly stressed through the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (1992), where participating nations drafted an Agenda 21 as a "world action programme" for the twenty-first century.

Forest issues were among the most controversial topics negotiated in Rio. The prevailing North-South polarization in this field did not permit agreements beyond the text of the "Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests" (also called "Forest Principles") and Chapter 11 of Agenda 21 ("Combating Deforestation").

Before and after Rio a number of conventions and internationally legally

binding instruments touching forestry issues have been signed and in part ratified by the international community. The more important ones are:

- Convention on Wetlands (Ramsar, 1971)
- Convention for the Protection of World Culture and Natural Heritage (1972)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973)
- United Nations Framework Convention on Climate Change (UNFCCC, 1992)
- Convention on Biological Diversity (CBD, 1992)
- Convention to Combat Desertification (UNCCD, 1994)
- International Tropical Timber Agreement (ITTA, 1994)
- Kyoto Protocol (1997).

Their diversity indicates the fragmented nature of the international forest policy regime.

2.1.2 IPF-IFF processes

In the ensuing climate (post-Rio) of confidence building and emerging partnership, the United Nations Commission on Sustainable Development (CSD) established in 1995 the Intergovernmental Panel on Forests (IPF) to further the dialogue started at UNCED and to encourage an international consensus on key issues related to forestry. In the two years of IPF's existence 136 proposals for action on forestry issues in sustainable forest management (SFM) were discussed internationally, including national forest programmes, criteria and indicators for SFM, underlying causes for deforestation, traditional forest-related knowledge, etc.

In 1997 IPF was followed by an *ad hoc* open-ended Intergovernmental Forum on Forests (IFF), which was given the mandate to continue IPF's work and to:

- implement the proposals for action developed by IPF;
- address issues on which international consensus had to be achieved;
- identify possible elements of, and work towards, consensus on an internationally legally binding instrument (e.g. a Forest Convention).

The work of IPF/IFF was supported by the Interagency Task Force on Forests

(ITFF) and the Forestry Advisors Group (FAG). While ITFF was to ensure the UN system's coherent support to the process, FAG was to promote the consistency between the IPF proposals and international cooperation programmes.

IFF will have its fourth, final session in February 2000 and subsequently submit its report to the eighth session of CSD in April 2000.

The IPF proposals for action have received worldwide recognition and have been endorsed by a large number of international and professional fora convened during the past two years. Other indirect effects of the IPF/IFF process have been:

- increasingly consistent recommendations to intergovernmental organizations from their governing bodies on forest-related issues;
- strengthening of international professional networks;
- increasing recognition of the environmental services rendered by forests (e.g. in the CDM, Kyoto Protocol);
- a six country initiative (Finland, Germany, Honduras, Indonesia, Uganda and United Kingdom) to review the implementation of the proposals for action;
- review of forest policies in many countries.

However, up to now, no consensus on the need to develop a legally binding international agreement on forestry issues has been achieved, and this is unlikely to happen in the final IFF session.

2.1.3 Criteria and indicators

Criteria and indicators (C&I) are tools for assessing regional and national developments in forest conditions and forest management. They are designed to provide a common framework for describing, monitoring and evaluating progress towards sustainable forest management in different countries. Depending on the region and types of forests under discussion, a number of initiatives have emerged:

- The ITTO (International Tropical Timber Organization) process, covering 28 producer countries of tropical timber;
- The Ministerial Conference on the Protection of Forests in Europe (so called Helsinki process) for the boreal, temperate and Mediterranean

forests of Europe;

- The Montreal process covering 12 non-European boreal and temperate countries;
- The Tarapoto process for the Amazon Cooperation Treaty Countries (8);
- The Lepaterique process for Central America (7);
- The dry-zone Africa process;
- The Near East process.

ATO (African Timber Organization), CIFOR (Centre for International Forestry Research), FAO, ITTO and IUFRO have all played a part in furthering and coordinating the development of C&I.

However, while work on conceptualization, elaboration, harmonization and testing of C&I at the regional, eco-regional and national levels has progressed, the adaptation and implementation of C&I at the management unit level requires still more effort.

2.1.4 Certification

The awareness of unsustainably harvested tropical timbers has given rise to the concept of "ecolabelling": Buyers may only want to purchase timber if its sustainable management and harvesting has been proven and certified by a respectable, acknowledged institution or company. The stated purpose of certification is to reward and thus induce good forest management particularly in the tropics by providing an additional marketing tool for the timber produced.

At present more than 90 certification schemes exist, the best known of which is that administered by the **Forest Stewardship Council (FSC)**.

In Europe a **Pan European Forest Certification scheme (PEFC)** has been developed, through a bottom-up process convened by European small forest owners.

Some countries, such as Canada, Finland, Ghana, Malaysia and Indonesia, are establishing their own national systems. While FSC, for example, is focussed on single forest owners, these national processes are aimed at improving forest management of larger areas, independently of type of ownership.

In the meantime, timber certification is taking off; FSC alone claims to have

more than 16.5 million ha certified, i.e. about 0.5 percent of the world's forests. However, most of these have been certified in temperate and boreal regions rather than in the tropics.

Although most countries and producers look at certification primarily as a marketing instrument rather than as a tool to improve forest management, and its overall impacts up to now are limited, certification clearly has the potential to encourage stronger efforts towards SFM. However, national certification schemes might eventually assume greater importance, because they address much larger forest areas, and because some of them are national processes developed in major exporting countries of tropical timber.

Nevertheless, considerable work has still to be done to establish mutual recognition between the different certification schemes and agreement on minimum standards.

2.2 At the national level

The international processes focusing on sustainable forestry issues have also had significant impact at the national level, and international NGOs such as WWF, IUCN, etc., and their local chapters have played a key role in this process.

In many developing countries, natural climatic extremes such as droughts and floods are generating increased awareness of the environmental functions of the forests.

Many developing countries have signed the various conventions or agreements binding them to an improvement in their forest management. Regional groupings such as the CCAD (Central American Council for Environment and Development) or ACT (Amazon Cooperation Treaty) and activities like the CBA (Central American Biocorridor) are evidence of an increased awareness of the importance of forests for regional and national development.

Presently, about 100 countries worldwide have drawn up forestry programmes. These are broadly referred to as "national forest programmes" (NFPs). Within the NFP framework, new forest laws, policies and strategies have been developed. Some countries have also

started national C&I and certification processes.

However, although forest policy and legislation in many countries is reaching an internationally agreed standard, its implementation rarely is. Reasons for this include lack of political will, collusion of public and private interests, lack of training, lack of reinvestment of profits made in forest operations, lack of financial and personnel resources of forest departments (FD), and lack of monitoring and supervision of forest operations through the FDs.

3. Challenges ahead

The challenges we are facing in the next millennium are nothing new, they have only become more pronounced. Underlying are two interrelated realities, which have to be addressed:

1. The main causes for the degradation or loss of forests are conversion to agricultural uses or pasture, overgrazing and shifting cultivation, rather than unsustainable timber harvesting.
2. In the short term unsustainable timber production is still more profitable than SFM. This is particularly the case in the tropics.

3.1 How to balance a growing hunger to convert forest land against sustainable management and conservation of forests ?

Up to 2025, world population is forecast to increase to 8 billion people (UNDP, 1999). This population increase will mainly affect developing countries in Asia, Africa and tropical Latin America and will accelerate the pressure on, and loss of, the remaining forest resources for their conversion into arable land, pasture, and infrastructure (Ayensu *et al.* assume up to 30% during the next 100 years).

"Many people living in subsistence economies have few alternatives to depleting their natural resources" concludes UNEP (1999). Facing the pressing needs of today they have no choice but to destroy the basis for a better living of future generations. Thus, one of the ways to reduce forest degradation and deforestation is to cure the roots of poverty and hunger.

The international community has to appreciate and accept that for many governments of the developing countries conservation or sustainable management of forests is not a priority. Poverty reduction, elimination of hunger, and the need to gain foreign exchange to pay back national debts may be considered more important than e.g. biodiversity conservation. Also, the question "how much forest Country X needs to guarantee its sustainable development?" is difficult to answer. Why should developing countries be prevented from using their forest wealth for agricultural and industrial development, as European and North American countries did?

It is current wisdom that in order to seek a better balance, countries should be assisted in pursuing the following:

- good governance;
- integrated legislation at the national and regional level;
- comprehensive national development strategies;
- integrated land-use planning and implementation of the plans;
- increased stakeholder access to resources, participation and benefit sharing in forest operations;
- replacement of sector concepts and single issue projects with multisectoral concepts and integrated programme approaches;
- integrated ecosystem management.

The challenge is a successful delivery of implementation.

3.2 How to strengthen the implementation of national forest policies ?

The present concepts to measure sustainability of forest management in different ecoregions and forest regions are as comprehensive as possible. However, they thus become more and more complicated and difficult to implement for foresters particularly in tropical countries.

Also, we have to accept that in the short term unsustainable forest utilization is still more "profitable" for investors than SFM. Implementing an increasingly complex set of measures to guarantee overall sustainability thus may become unattractive to the forest operator. A way forward could be to agree on some more simple minimum

performance standards for **improved forest management** – a minimized national C&I approach.

Rather than internationally agreed C&I, these more simple guidelines or performance standards might be extracted from a country's national forest legislation. Consequently, they would already have a legal basis in the country, would be geared towards national particularities and would not need any further international consensus. It would be important, however, to have these Codes of Practice accepted by the people working with them in order to facilitate their implementation. This could be done in a national consultation process involving the most important stakeholders (small farmers and other private owners, indigenous people, forest industry, communities, etc.) within the framework of the National Forest Programme (NFP). Rather than trying to improve forest management through a top-down process the proposed approach would be a bottom-up one. The Codes suggested could become stepping stones on which to climb through a process of increasing sophistication.

3.3 How to make sustainable management more profitable ?

It is common knowledge that the value of forests is much higher than that defined by its wood production, be it as a provider of non-wood forest products, recreation, fresh air, carbon sink, or water.

Local and regional access to **water** for drinking and irrigation is increasingly becoming an issue. Potential shortages may trigger conflicts for water, but may also force governments to protect watersheds in a proactive way.

It is also known that indirect and/or long-term effects on ecosystems and society due to unsustainable forms of forest management rarely enter cost calculations of forest operations. As long as the short-term return on land is higher, for example for palm-oil or natural rubber production, SFM is losing out to other land-use options.

Up to now, no generally accepted monetary value could be allotted to the service and amenity values of forests, as well as to the negative impacts of for-

est operations, nor has their contribution towards national economies been quantified. The **challenge** will be to quantify and internalize these externalities and put trade value to them, thus allowing SFM to realize its true worth.

3.4 How to provide financing mechanisms for the promotion of sustainable management and conservation of forests?

Loss of biodiversity, global warming and other environmental concerns have brought tropical forests to the centre of world attention. Their ecological contributions are recognized as being not merely of local or regional significance, but of global importance. If the industrialized countries, which consume more than 80 percent of the world's resources (Scheer, 1999) and which produce most of its pollution, want developing countries to embrace the concept of SFM, they may have to pay for it.

In the context of biodiversity conservation, the Global Environmental Facility (GEF) has been founded to assist in projects to avert the loss of biodiversity. A comparable parallel funding mechanism for SFM might be discussed. It should function in addition to the general ODA and could incorporate funding mechanisms like the Clean Development Mechanism (CDM) and Joint Implementation under the Kyoto Protocol, national and international energy or other eco-taxes, funds from a Tobin tax, and others. An example for such a fund could be the Costa Rican FONAFIFO funding the Private Forestry Project.

3.5 How much forest do we have worldwide, and how can we continuously monitor it?

FAO has always been, and still is, at the forefront of forest inventory execution and data management. Since 1970 we compile every ten years a worldwide Forest Resources Assessment. With this background we realize how limited the real forest information base really is.

The challenge will be to build up a functioning, continuing global monitoring system for forest resources and land-use changes on forest land, combining remote sensing with ground truthing.

3.6 How will forests react to global warming ?

There is a growing consensus that the Earth is going through a phase of global warming, as is also reflected by the UN Framework Convention on Climate Change and its ensuing process.

This process will affect vegetation. Do we know what global warming means to species composition and distribution and their growth in given forest areas?

Within the framework of the Global Terrestrial Observation System (GTOS) a network of institutions and organizations is trying to measure the impact of global warming worldwide, and to model different scenarios. However, GTOS is still in its initial stage. A challenge will be to take up this task at a level of as yet unprecedented international cooperation.

3.7 How to bring the levels of international policy dialogue and field reality closer together ?

In spite of all the laudable efforts on the international scene, the two levels of addressing forest management are still far apart:

1. The international forestry dialogue and different country and private initiatives have made continuous progress.
2. At the field level, destruction and degradation of forests continue. Mankind still loses annually between 10 and 13 million ha of forests.

As yet, linkages between the degree of understanding reached at the international level and the reality on the ground have only been achieved in a small number of cases.

It is not yet clear what will come after the end of IFF, but it can be safely assumed that the international debate will continue in one form or another. While the importance of developing international consensus in this field is unquestionable, the process could benefit from stronger links with the operational level to improve the applicability of proposals for action.

Also, economic realities have to be taken into consideration (Barrett, 1999). Here, national governments, as well as

bilateral and multilateral development agencies, have to play a stronger role in feeding back field experiences into the international dialogue in order to get it closer to reality. This approach may also assist in starting with less ambitious goals, which can be gradually pushed higher over the years, thus facilitating consensus building at the political level.

On the other hand, the operational level (in particular the private sector) can benefit considerably from a stronger direct input into this debate.

Presently, the international debate is mainly led by representatives of governments, international civil servants, scientists, consultants and representatives of international NGOs. The participation of other parts of the civil society is minimal,

in particular participation by the private sector, which in most countries manages the forests. For a successful conclusion of the dialogue and in order to implement practical proposals, broader participation is needed by those dealing with field-level realities.

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The Potential of Educational and Outreach Programs for Public Awareness and Adoption of Practices for Forest/Natural Resource Sustainable Use

T.Ammour¹, R.Guevara²

Introduction

Inappropriate use of forest resources in developing countries is caused mostly by poverty, inadequate policies and legislation, and macroeconomic decisions related to land use which have exacerbated poverty in developing countries. Additionally, other factors also play an important role: structural and institutional deficiencies or weaknesses; an imbalance in the different kinds of training and education; the general lack of education; the incipient research and validation in sustainable forestry development and conservation; the weak or inexistent outreach and technical cooperation provided to people in communities inside or

around forests; and the lack of or deficient empowerment and participatory approaches that exist to involve the communities and the people.

Despite several national and international efforts and initiatives carried out in association with forest conservation, the main concern remains on the interface between human systems and natural systems, and on the key issue: how to promote awareness and adoption of practices and attitudes to promote the reconciliation between conservation and development. Lessons learned from experiences throughout the world have lead to the conclusion

that the driving force of the conservation of natural resources and forests within a development process is *human resources development*.

Learning/education processes and knowledge generation as inputs to build up social capital

The new paradigm of sustainable development, in which forestry is included, implies environmental protection, participation, natural resource improvement, and equity. This entails the development of a sustainable society with a new ethical frame of reference so that it takes into account inter and intragenerational consciousness with regards to natural resource utilization. In this context, two issues must be addressed:

- the generation and transference / adoption of new knowledge addressing sustainability, and
- the empowerment of people through which the society, and in particular the direct users of natural resources, are suited to decide what is best for the/their development, and that of future generations.

In the first case – new knowledge addressing sustainability – the challenge is to generate outputs from research which contribute to meeting today's needs in an integral way, contributing to

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the capacity of future generations to meet sustainability. Strategic research as well as applied research and development activities with partners and with direct users is crucial to accomplish the objective.

In the second case, the challenge is to spark off – at different levels, farmers, technicians among others – learning processes to share, acquire and use organizational, intellectual, and technical capabilities so as to strengthen managerial and participatory capabilities to improve social capacity to generate solutions.

In the area of forestry development and conservation, basic problems can be addressed if i) education and training are made available and/or improved, ii) research and validation are intensified and refocused toward addressing sustainability, iii) validated results are disseminated through an articulated outreach and technical cooperation program, so that people with the most need can adopt new technology and innovation, and iv) the activities are supplemented with appropriate participation and empowerment methodologies, proper policies, and legislation for land use, aimed at alleviating poverty and protecting the environment.

With these mechanisms in place, poverty alleviation and the appropriate use of forest resources would have higher success rates, and will lead to human well-being, rather than to continued misery.

Human Resources Development in Central America as a tool to promote awareness and adoption of sustainable practices for forest management: experiences from CATIE³

CATIE's mandate and strategies are designed to contribute to long-term sustainable development in the Region. CATIE is an International, non-profit civil association, whose purpose is research, education – training and postgraduate studies – and outreach in tropical agriculture, natural resources, environment and development and related subjects, in the American Tropics, with emphasis on Central America and the Caribbean. CATIE's mission is to improve the well-being of humankind by applying scien-

tific research and higher education to the development, conservation and sustainable use of natural resources.

CATIE's main activities are:

- a. The generation and validation of technological practices for agricultural production and natural resource management, which are economically feasible, socially and culturally acceptable and environmentally sustainable.
- b. The preparation of professionals at postgraduate level to contribute to the development of knowledge and execution of programs conducive to the solution of the socioeconomic and agroecological problems in tropical America.
- c. The transfer and promotion of proficiency in technological practices developed through institutional collaboration and dissemination to end users.
- d. The dissemination of the information generated and technical cooperation for the adoption of new technological practices.

CATIE's strategic and applied research focus on Forestry and Agroforestry Systems, Strategic Inputs for Sustainable Agriculture, such as integrated pest management and plant genetic improvement, and Valuation of Natural Resources. Specific areas of research support technology are Biotechnology and Geographic Information Systems.

Graduate education operates in close cooperation with research work, offering Master of Science and Doctoral Degrees in four broad areas: ecological agriculture, agroforestry systems, management and conservation of tropical forests and biodiversity, and environmental economics and sociology.

Outreach strategic functions focus on: i) the management and dissemination of information, ii) the development of human resources through training, and iii) dissemination of land-use technologies and management systems. In the first case, the most important activities deal with the compilation, integration, publication and dissemination of information produced by CATIE and others to support the activities and specially the decision-making processes of

those engaged in agricultural and forest production or in conservation of natural resources and the environment. In the second case CATIE provides training services to develop the cognitive abilities and technical skills of professionals as a means to strengthen the operating capacity of organizations and institutions for natural resources, including agriculture, forestry and the environment. In the third case, technical advisory assistance, research and development projects and multilateral cooperation are the main mechanisms used to improve agricultural and forestry production while conserving natural resources and the environment.

Figure 1 presents how CATIE's strategy and priority research, education and outreach activities are designed as means to accomplish its mission in the region, through the main centers of decisions: the private sector, the policy decisions makers and the technical professionals and decision makers.

An example of CATIE's research and development effort to increase human development for rural development: the "Conservation for Sustainable Development in Central America" (Olafo) and "Wise Use of Mangroves" (Mangroves) Projects.

The following is a concrete experience to illustrate how applied research coupled with education and outreach strategies and activities have led to the adoption of sustainable management models for forests and natural resources, and to the awareness of communities, decisions makers, technicians, and donors of the need to support these types of structured programs.

Projects overview

The origins of the "Conservation for Sustainable Development in Central America" Project, commonly known as the "Olafo Project", and the "Wise Use of Mangroves" Project date back to 1989 when the publication of the Report on the World Commission of Environment and Development and the Brundtland Report spurred the drafting of the Project. This shifted the thrust of the need to couple important biological research components with field-based focused projects aiming to test whether conservation and development could

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coexist harmoniously in the context of local communities managing their natural ecosystems.

Regional ecosystem diversity within reach

Three demonstration areas were developed in the lowland tropical forests of Central America: Guatemala (Petén, San Miguel), Costa Rica (Talamanca), Panama (Bocas del Toro). Two were established in mangrove ecosystems: Nicaragua (León and Estero Real in the

Golf of Fonseca) and Costa Rica (Térraba Sierpe). In addition, two replication areas were initiated in Honduras (San Ramón, Atlántida), and Guatemala, Petén (La Pasadita).

These areas are located on the edge of the agricultural frontier where production competes natural forest use, and biodiversity conservation. The traditional practice of slash-and-burn opens the way for agricultural and cattle ranching expansion. These zones are

characterized by: low population density, social heterogeneity and lack of organizational cohesion, difficult access, weak institutional presence, and agricultural practices which are incompatible with the ecosystems' potential. Because of the project's demonstrative nature and the ecosystems' diversity, the beneficiaries are "campesinos", small cattle ranchers/"colonos," indigenous people, and all of those who rely on forest and/or marine resource extraction.

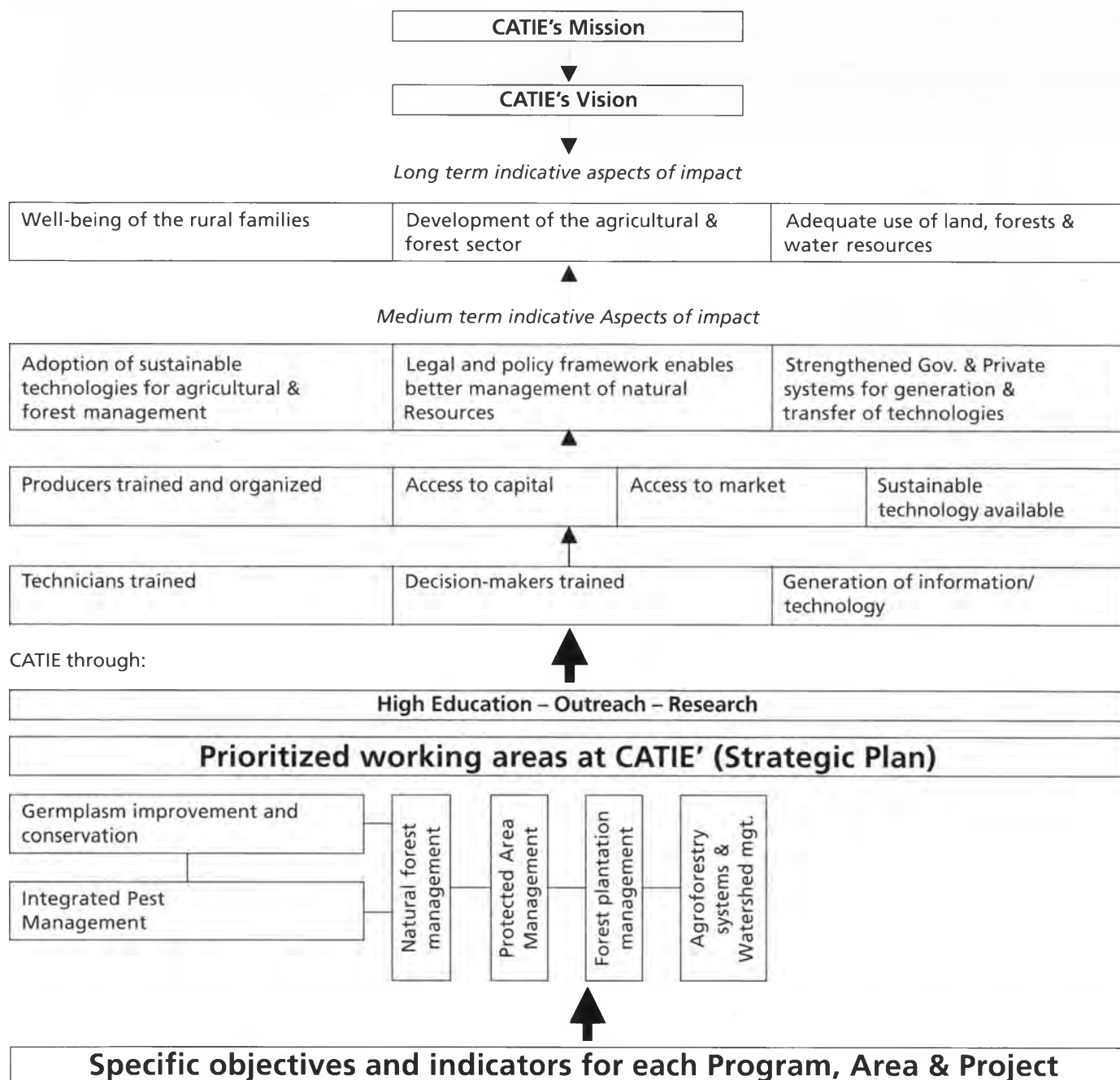


Figure 1: CATIE's general Monitoring & Evaluation Strategy to accomplish its mission

The hands-on approach

The Projects' objective is to develop, jointly with local communities, and with the support of national institutions and non-governmental organizations, rural development models for the sustainable management of natural ecosystems typical of Central America's agricultural frontiers/forest margins. The hypothesis is to demonstrate the viability of sustainable production in natural ecosystems in order to improve the population's quality of life while protecting the environment.

Olafo is committed to rural development bounded by a concrete strategy

which promotes community involvement. Some of the Project's strategy aspects which reflect this commitment are:

- participatory approach to promote involvement of the direct beneficiaries/users of natural resources in the decision-making process;
- multidisciplinary methods;
- analysis at different hierarchy levels (specie and component, familial unit, community/landscape and regional level) ;
- a hypothesis-testing-evaluation-decision process which requires a reflexive analysis based on the sustainable development objective;

- the transfer of methodologies and experiences throughout the Region.

The main working lines to meet the challenge of innovating in research while demonstrating new ways to promote development include:

→Research & Validation

- Non-timber forest resource management (ecology/production through domestication in natural conditions)
- Diversified forest management (both timber and non-timber)
- Agroforestry and sustainable agriculture
- Economic evaluation of goods and

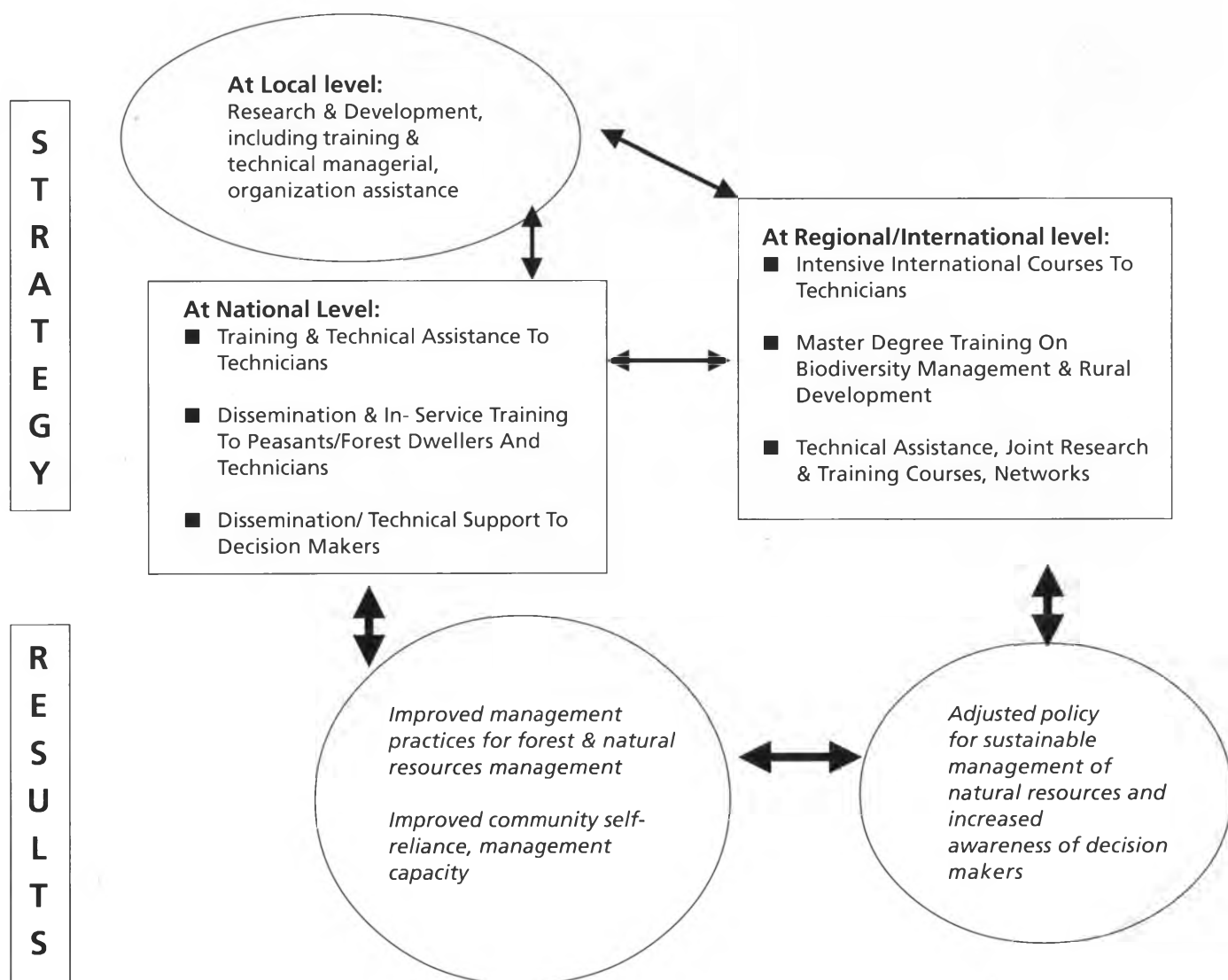


Figure 2: Simplified strategy and results of the Olafo/Mangroves Projects for human development based on research & development activities for sustainable use of natural resources in Central America

environmental services

- Evaluation of family production system sustainability
- Participatory land use planning at a regional level

→ *Community outreach*

- Strengthening community organization for production based on natural resources
- Training and technical assistance

→ *Institutional Outreach*

- Training and technical assistance
- Generating technical knowledge for natural resource management policies

→ *Teaching*

- Support to the Master's Degree in Management and Conservation of Biodiversity

Outputs generated

Consistent with the demonstrative characteristic of the projects, the three most important products generated are useful for:

- demonstrating, in the field, the compatibility between conservation and development
- providing methodologies, and scientific and applied knowledge to national and regional institutions, in order to orient, with a holistic approach, the management of tropical biodiversity in its ecological, productive and human dimensions.
- supporting decision makers in regulatory processes for the sustainable management of natural resources in broadleaf and mangroves ecosystems.

Strategy of human resource development

The association of three types of work focus: applied research – human resource development – and information dissemination have been key to the success of these Projects. Figure 2 shows, in a schematic way, the strategy of linking applied research, training and education at different levels. In particular, the Projects have impacted on human development at four levels:

- At the local level, strengthening community self-reliance
- At the national level improving awareness and capability of national institutions in conservation and

development, and promoting the adjustment of policies to stabilize populations in agricultural frontiers and in particular, promoting sustainable forest management.

- At the regional and international level, having a multiplier effect of best experiences and practices in the Central American isthmus.

The formation of human resources aided by the results from research/validation, was seen at different levels, in different aspects and varied according to the maturity of the knowledge generated.

The systematization and ordering of knowledge and experiences – in a way that they can be disseminated and transferred through courses to different national and international levels, took force about four years after field level activities were initiated.

The permanent updating of teaching materials, at the Master's as well as at the training level, became, in this case, an opportunity to review and adjust the sequence of methodologies and results.

As can be seen in the table above, the education/training modalities for technicians outside of the local level were several:

- In 1994, a Training Course was created with international scope (mainly Latin America) on Rural Development based on tropical ecosystems management – with an emphasis on agricultural frontier areas. This course is part of the Strategic, or permanent courses that CATIE offers each year.
- Modular training courses in the countries. These courses were designed as a means to train and provide technical assistance in a modular manner, to those technicians involved in natural resources management projects and programs with rural communities. These thematic modules allow knowledge, concepts and tools for design and rural development process implementation to be transmitted. These modules are complemented with technical assistance activities to improve the performance of the technicians in their own work areas, directly applying that which has been learned during the technical/practical courses.

Even though this modality implies higher costs and greater efforts, it has been proven that the effectiveness of the training can improve significantly.

- Establishment of cooperation networks with information for tropical biodiversity management, and in particular on non-timber forest resources.
- Creation, in 1994, of sub-specialization at the Master's degree in Management and Conservation of the Biodiversity. This orientation transformed the traditional Master of Science in Protected Areas, widening it, on the accumulated experience in the work areas of the Olafo and Mangroves Projects, as well as of other experiences in related areas (watershed management, natural forest silviculture, among others).

Through all this, CATIE aims to capitalize on its institutional experiences, and also to improve the services that it offers in its region of mandate, to fill the demand for professionals trained to confront those challenges set forth in the Agreements of the United Nations Conference on the Environment and Development (UNCED), established in 1992 in Rio de Janeiro, Brazil. With this orientation in graduate education, the region can act in situations where the people must use tropical ecosystems but simultaneously protecting them, seeing them as aspects related to a general focus which assures the existence of biological diversity and also maintains permanent access to the benefits derived from it.

As results and methodologies are generated and systematized at the field level, they were incorporated into the Master's Program. Thus, between 1994 and 1999, new courses covering the evaluation of sustainability of natural resource management and on concepts and tools for the diversified sustainable management of forests were incorporated into the curriculum.

Results from human development based on applied research in sustainable use of natural resources.

As of 1999, over 2000 rural inhabitants benefited directly from the projects' activities, while short-term indirect

Table 1: At local, national and regional/international level, activities and topics transferred/ disseminated to different types of beneficiary.

Levels	Beneficiaries	Topic	Means
Local	Communities	<ul style="list-style-type: none"> ■ Community organization, administration/management 	<ul style="list-style-type: none"> ■ Technical assistance/ in-service training ■ Formal/practical courses ■ Accompaniment
	Groups and Leaders	<ul style="list-style-type: none"> ■ Community organization, administration/management ■ Legal aspects of the organization ■ Organization for production ■ Conflict solving ■ Management practices (production, processing, marketing) 	<ul style="list-style-type: none"> ■ Technical assistance ■ Formal/practical courses ■ Accompaniment
	Families	<ul style="list-style-type: none"> ■ Management practices (production, processing) 	<ul style="list-style-type: none"> ■ Technical assistance ■ Formal/practical courses ■ Accompaniment
National	Technicians, Researchers and Decision makers	<ul style="list-style-type: none"> ■ Methodologies/tools to design and implement rural development processes based on natural resources with local communities 	<ul style="list-style-type: none"> ■ Modular teaching for training ■ In situ services training ■ Bilateral cooperation and research networks, formal courses; ■ Dissemination of technical publications
Regional & International	Technicians	<ul style="list-style-type: none"> ■ Methodologies/tools to design and implement rural development based on RNR management with local communities 	<ul style="list-style-type: none"> ■ Intensive courses (one month) ■ Formal Masters level courses

beneficiaries are estimated at 60,000 people (more than 10,000 families) due to multiplier effect (legal, organizational and technical) of demonstration/application areas in the regions where they are located.

The most relevant results and impacts related to human development through education and training can be presented as follow:

♦ **Building Self-Reliance For Tropical Biodiversity Management**

Olafo has enabled the empowerment of 25 groups in Guatemala, Honduras, Nicaragua, Costa Rica and Panama. This notable impact benefited approximately 430 families. Of the total number of groups, nine were organized as formal enterprise, and consequently are now in a position to formally negotiate for external support from technical and credit institutions and NGOs.

The groups have acquired greater self-governing, decision-making and conflict solving skills, enabling the national institutions in charge of development and natural resource management to elaborate their own activities. One key issue is that productive activities require entrepreneurial organization, which differs from that of the community associations. Therefore, the creation and strengthening of small rural enterprises has focused on those families directly involved in the productive activities.

In Guatemala, for example, the community model of rural development within the framework of Community Concessions has been designed and successfully implemented from the organizational, financial and legal standpoints, nationwide. This concession earned Presidential Recognition on three occasions in 1995 and 1996. President Carpio awarded the community an honorary Degree for sustainable agriculture; Pre-

sident Arzú, during the International Earth Day, praised the community for its work in favor of the protection and sustainable use of biodiversity. Likewise, during the 75th Anniversary of the Ministry of Agriculture, Livestock and Food (MAGA), special recognition was made for the community of San Miguel for his contribution to Sustainable Forest Development in the Petén Region.

These results stemmed from strategies focused on solving immediate needs. As a Honduran "campesino" aptly stated, "When the Project got there, we awakened, since we weren't a community, but rather a disjointed village. We did not work together for common goals. Now, when we decide to fix the road or the school, we all participate actively in the endeavor. For me, the Project transfers knowledge, and this is what helps us to do good work. Now, we know for a fact that our community will prosper" (Ceferino Guevara, Honduras).

This illustrates that improving local groups' management skills must be not only a means, but rather an end in itself, to promote conservation and development.

♦ **Bridging the Gap**

As a consequence of impacts generated in the field, several institutions, both governmental and non-governmental became interested in the experiences and became increasingly involved in the implementation of the demonstration areas and in the development of their zone.

In addition to the significant participation of official counterparts, it is important to mention that about 30 institutions have been involved directly in the Projects' areas. Of these 30 institutions, 46% corresponds to Government institutions linked to agriculture extension, public works, and agricultural research. In addition international institutions and non-governmental organizations have collaborated directly with both implementation on-field and dissemination of the results.

♦ **Promoting Policy Up-Dating**

One of the critical issues for institutions dealing with natural resource research and/or rural development, are the legal limitations to the application of sustainable management practices. The Olafo and Mangroves projects attended the problem of land use rights recognition (particularly in Guatemala) as a prerequisite for initiating a process of sustainable development. Additionally, in the case of non-traditional resource management the projects contributed to the definition of legal regulations.

Since 1994, the Guatemalan Government has recognized the Community Concession as a legal entity. Based on the Community of San Miguel experience, governmental institutions, International Agencies of Cooperation, NGO's and other communities consider the Community Concession as a powerful tool to promote natural resource conservation and community development in Petén.

In Nicaragua, a solid foundation for a mutually agreed upon participatory Land Use Planning Strategy of the pacific mangroves in Estero Real has been created via an effective communication network. Both MARENA – the Ministry

of Natural Resources and Environment – and APESCA – in charge of Fisheries Development – use the land use plan elaborated by the project as a basis for awarding concession permits.

In the case of Costa Rica, the Wildlife General Directorate of the Ministry of the Environment and Energy (MINA), in charge of the application of CITES' regulation, adopted a technical proposal for regulating the sustainable use of *Zamia squinnersi*, an endangered ornamental plant. Also, the Ministry of Health included technical recommendations for the cultivation and management of medicinal plants in the regulations about plants used for natural medicine production.

♦ **Sharing the Wealth of Knowledge**

For the last 10 years, governmental, non-governmental, private and community sectors from Central and Latin America have benefited from CATIE/Olafo's and Mangroves' results and experiences. In fact, the demand for training, technical assistance and cooperation has increased significantly. Following CATIE's philosophy, professional training and education are the real existing weapons to ensure that the men and women in the national institutions, NGO's, projects and communities, are prepared to run sustainable rural development models.

Training And Teaching For Action

In fact, between 1990 and 1997, approximately 5000 technicians, extensionists, farmers and business-people from the private sector have been directly and indirectly involved in training and dissemination activities carried out through approximately 250 events such as in-service training, short courses, and local, national, and regional workshops.

The results generated provided the Projects with the ability to answer a growing demand for a transfer of their accumulated experience and new methodologies to the different stakeholders in the Region.

Of the total training activities beneficiaries, 44% corresponds to governmental institutions, 27% to NGO's, 24% to Universities (graduate and under graduate levels) and 5% to CATIE/Olafo and Mangroves projects.

The impacts reach further than just training activities: the project's personnel have contributed to 28 courses in CATIE's Masters Program. In total, 104 students – 69 from CATIE's Master's Degree Program and 35 under-graduate students from other universities – were advised by the Olafo Project technicians – including two Doctoral Thesis students and specialization research. Of the total number of students, 33 were from South America, North America and the Caribbean.

An important issue is that, in general terms, after completion of their studies in the Master Degree Program, most of the professionals assume key positions as policy decision-makers, technical decision-makers, teachers at Universities or coordinators of development/research programs in their respective countries.

Once again, the demonstration areas played the protagonic role, becoming crucial in Latin American students' training. These, in turn, crystallized the knowledge gained and simultaneously provided research results for CATIE, and the Region. The professionals trained at CATIE and in other institutions are today our allies in national institutions, non-governmental organizations and in other projects.

The Ties That Bind: Cooperating Within Latin America

Project activities opened spaces to different institutions of the Region to deal with relevant issues of sustainability, such as sustainable use of non-timber forest resources, community management of natural forests, productive mangrove forest management, community organization for production, economic evaluation of natural ecosystems, models for sustainable rural development based on natural ecosystems management, and policy formulation and implementation to enhance sustainable resource use.

– These topics are particularly relevant to the technical strengthening of institutions accomplished mainly through assistance and cooperation to approximately 190 institutions of which 30 are in Central America, nine are international and more than 150 others are involved in networks.

The three most important impacts refer to the incorporation of new work lines within the NGO's, public and private sector institutions, universities and research centers; the establishment of strategic alliances; and the consolidation of topical networks.

In the case of institutions such as the Technological Institute of Costa Rica (ITCR/UCR), the National School of Agriculture (ENA) and the "National Honduras Autonomous" Regional Center of the Atlantic Coast, in Honduras (CURLA), among others, the incorporation of work lines refers to research, training and teaching in the management of timber and non-timber forest products.

In this context, strategic alliances have been developed with regional and international institutions such as the Central American TRAMIL Program, the World Wildlife Fund (WWF), The World Conservation Union (IUCN), and the Iberoamerican Program of Science and Technology for Development (CYTED), among others.

In the field of regional cooperation, the contribution of the Project to three topical networks stands out. These were: the Mesoamerican and Caribbean Herbarium Network with 23 members; the Iberoamerican Network for Pharmaceutical Plant Products (RIPROFITO) in which 69 institutions participate, and the BIODATA Network in Costa Rica. This networks have the objective of facilitating the administration, the generation and exchange of information in order to conserve, know, disseminate and sustainably use the country's biodiversity (60 institutions participate).

Lessons learned

We have learned that creating awareness and adoption of practices (productive and legal) for sustainable natural resources management requires some basic conditions:

- a) Continuity over time in the actions to build on human development: short-term thinking is the best way to fail.
- b) Constructing ties between local, national and international levels: efforts put on translating the knowledge generated from local to national level and from local and national to international level is a key issue.

Technicians and decision/policy makers at the national level and in international organizations with local and national roots have a huge responsibility in this matter.

- c) Systematization, "translating" information to adapt it for different audiences and disseminating the knowledge generated at the local level, in aspects of technical management of natural resources and in organizational, economic and legal aspects, is the only way to feed the decision-making processes. This must be done to improve the sustainable management of natural resources.
- d) Separation of research and teaching from human resource development and from political instances is one of the greatest obstacles faced by this sequence. The Olafo and Mangroves Projects impact within CATIE where research, teaching and outreach are intimately integrated. The capitalization and dissemination of experiences generated in different areas under different social, economic and ecological conditions, has been possible for the following reasons:

- Positive results obtained – in terms of natural resources management and improvement of the well-being of rural families – are useful and coherent with the interests of the technical and political decision-makers: decrease the social and economic pressure exerted in using natural resources. To achieve this, work was developed toward establishing and strengthening the consciousness to deal with sustainable development at the community level, including technical elements to adjust the rules and regulations for natural resource use.

- Results obtained at the local level permit various governmental and non-governmental institutions dedicated to development and higher education to implement their work programs, because the communities were organized and responded effectively to their initiatives. In this sense, these institutions (for example the Ministry of Health, technical training institutes, development agencies etc.) were able to interact with each other,

complementing their work, and approaching development in a plurisectoral manner.

- The response of the local people to the introduction of improved management methods is more favorable in poverty-stricken zones, where the institutions meet immediately felt needs. It is necessary to develop training to meet requirements to set up immediate production alternatives so as to augment income as quickly as possible. These can lead, at the same time, to an improvement in production systems and to an organization on a small scale, in such a way that initiates the beneficiaries in productive activities for the long term.
- It is necessary to consider community organization and self-reliance as an objective in itself. Experience acquired in the area of organization is just as important as the production alternatives that can be identified. In fact, the higher level of organization allows beneficiaries to assume the management of their own initiatives.
- Awareness and concrete solutions can be achieved only if conflicts are discussed and solved among the different stakeholders in a consensual manner.

What's next

The processes developed by CATIE/Olafo and Mangroves projects shows that in addition to improving income and employment, the most important achievements are: i) the mechanisms that were built in the communities allow them to continue their search for a better future, through their own efforts, long after Olafo and Mangroves depart; and ii) the technical capability strengthening in the governmental and non-governmental institutions throughout Central America and Latin America is key to achieve such continuity and particularly its effective dissemination through the Region.

If we consider that sustainable development is not a final stage that can be reached sometime, but rather an endless search to ease the changing tensions between human needs and the capacity of the environment to provide

goods and services to satisfy those needs without degradation, it is evident that the mechanisms built into these communities and institutions are the best contribution of any project can have to achieve sustainability. According to the Danish International Development Authority "the approach developed in Olafo and Mangroves will to a larger extent, make CATIE to be able to reach the

poorest farmers with solutions from its research, and thereby be able to provide tools for extensionists and future CATIE students to work with farmers and communities, providing general, integral, and not only technical solutions."

This type of strategy is feasible only if long-term commitment and funding from international and national organi-

zations is available to be invested in human development.

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Round Table: Funding within the Framework of International Processes Aiming at the Conservation and Development of the World's Forests

New and Innovative Financing Mechanisms for Sustainable Forestry

Claus-Michael Falkenberg

Summary

IPF/IFF Process

- Agenda 21 -> CSD (Commission on Sustainable Development) ->
- IPF (Intergovernmental Panel on Forest) 1997: agreed text on IPF proposal for action ->
- IFF (Intergovernmental Forum on Forest) 1999: practitioners guide for implementation of proposals for action
- IFF IV (Feb. 2000): matters left pending: Underlying Causes of Deforestation; Trade and Environment; Traditional Forest-Related Knowledge; Financial Resources in Forestry Development; Forest Dialogue after 2000

New and Innovative Financing Mechanisms

- Agenda 21: new and additional financial resources should be provided: 80% of resources for the develop-

ment of forest should be mobilised from the forest, 20% should be provided by the international community

- GEF (Global Environment Facility): new instrument to cover incremental costs for conservation: global benefits
- Transfer payment approach
 - mainly domestic: fiscal market-based instruments: taxes, ecological VAT, land use taxes, forest pricing, tree planting subsidies
 - mainly international: dept for nature swaps; GEF; environment/conservation funds; international taxes??
- Market approaches, internalisation of public goods
 - mainly domestic: payment for environmental services (water, biodiversity, CO₂, beauty)
 - mainly international: carbon offset trading (Clean Development Mechanism CDM); fair trade; certification
- Private/Public investment

- mainly domestic: micro-finance to local users
- mainly international: channelling private international flows

Approaches for New and Innovative Financing Mechanisms

- International level
 - forest fund: global financial gap
 - investment promotion agency: public private partnership; information gap
 - North/South debate: increase in efficiency, additional funds
- National level
 - co-ordination of financing mechanisms at national level
 - ODA: creation of an enabling economic environment

IPF/IFF Discussion on New and Innovative Financing Mechanisms

- Pretoria Workshop 1996
 - global gap between available resources (ODA and private capital) and what is needed (costs for afforestation): Forest Fund
 - why finance sustainable forestry?
- UNDP Study 1999 (Moura Costa, Salmi, Simula, Wilson)
 - Financial Mechanisms for Sustainable Forestry
 - Investment Promotion Agency

- UNDP: PROFOR
 - national financing strategies for National Forestry Programmes
- UNDP: London Workshop October 1999
 - An ideal international mechanism, whether existing or new, would
 - be open to all countries and transparent
 - respond to national needs and work through national forest programmes
 - contribute to internalising global externalities of forest in promoting sustainable forest management (SFM)
- link with national financing mechanisms
- be administratively efficient
- co-ordinate with the financing mechanisms of multilateral environmental agreements (MEA's) in order to avoid duplications, and
- have secure and sustained funding sources.
- An international forest fund and an investment promotion entity/agency (IPA) are complementary options for international-level instruments for SFM financing.
- Further work should be carried out on options to improve the effective-

ness of existing mechanisms or create new mechanisms in order to adequately increase investment into SFM

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The Role of Forestry in the Flexible Mechanisms of the Kyoto Protocol

Axel Michaelowa

Abstract

The Kyoto Protocol sets legally binding greenhouse gas emissions targets for industrialised countries and countries in transition. These targets are applicable in the "commitment period" 2008-2012.

Art. 3,3 states countries have to account for emissions/sequestration from "afforestation, reforestation and deforestation" – i.e. forest protection is *not* covered – since 1990 during the commitment period. Besides domestic action, countries may use several so-called "flexible mechanisms" that account for emissions reduction abroad. Art. 6 defines "Joint Implementation" (JI) which covers projects in countries with targets. Art. 12 lists rules on the "Clean Development Mechanism" (CDM) covering projects in countries that do not have targets. Finally, Art. 17 allows emissions trading between countries with targets.

While it is clear that JI covers forestry activities listed in Art. 3,3, it remains unclear for the CDM. The detailed rules for the flexible instruments and the exact definition of forestry terms have to be developed in the run up to the Con-

ference of the Parties in November 2000. So far, everybody has been waiting for the release of a Special Report of the Intergovernmental Panel on Climate Change (IPCC) on land use change and forestry. This report is due in spring 2000, but a draft has already been circulated for peer review. It is quite positive for the inclusion of forestry projects. Latin American and African countries have already strongly pressed for the inclusion of forestry in the CDM. NGOs as well as the EU, on the other hand, are against it. The private sector is strongly in favour as forestry projects are so far seen as the cheapest option for greenhouse gas mitigation.

In the pilot phase of emission reduction/sequestration projects abroad that started in 1995, 2 afforestation, 5 reforestation and 7 forest protection projects have been accepted but only partly implemented, mainly in Latin America. Methodologies to calculate sequestration/avoided emissions and projected lifetimes differed widely.

Critical issues that have to be solved before forestry projects are generally accepted as part of the flexible mechanisms are listed below:

- Sequestration projects incur the risk of accidental release of the stored carbon (e.g. through forest fires). Either projects have to ensure themselves against this risk or an accounting methodology has to be developed which calculates the emissions reduction equivalent of storage over time. There are different proposals for such a "ton-year" calculation that are discussed in the IPCC Special Report.
- Greenhouse gas measurement and monitoring methodologies have to be refined, especially for soil carbon.
- The baseline for forestry projects may be difficult to determine due to displacement effects ("leakage"). An aggregated methodology for national forest baselines has to be developed. Calculation of lifetimes should be streamlined.
- As forestry projects have to be maintained over long periods, they block the use of land and thus have been accused to be "carbon colonies", mainly by NGOs.
- Environmental and social externalities have to be taken into account.
- The accounting of wood products has to be clarified.

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Financial Co-operation with Developing Countries – Resource Conservation Projects

Burkhard Hinz

The statutory functions of **Kreditanstalt für Wiederaufbau (KfW)** are those of a promotional bank for the domestic economy and a development bank for the developing countries. With a balance sheet of around EUR 173 billion (as per June 1999) it counts among Germany's largest banks.

Under the Financial Co-operation (FC) of the Federal Republic of Germany with developing countries KfW finances investments and related consulting services on behalf of the Federal Government to expand the economic and social infrastructure and the manufacturing industry, to protect the environment and natural resources, and to develop financial systems. In 1998 the volume of loans, guarantees and grants being committed for this purpose corresponds to EUR 1.4 billion.

To finance projects and programmes under FC, KfW extends long-term loans at preferential interest rates, and gives grants to the least developed countries (LDC). Furthermore, KfW finances advisory measures to support its partners in the preparation, implementation and putting into operation of co-financed projects. Finally, it combines federal

budget funds with capital market funds into composite and mixed finance loans.

KfW administers FC independently and on its own responsibility, acting to guidelines established by the Federal Government. Its main activity is to promote projects that promise to be successful in terms of developmental impacts. The responsibility for these projects lies with the competent institutions in the developing country (project-executing agencies), but as a development bank KfW shares the responsibility for the success of the project.

Its part in the responsibility results from the obligations the bank has assumed vis-à-vis the Federal Government to undertake comprehensive appraisal and monitoring of the projects and provide advisory services, and the functions it has agreed to perform in this connection. One of these functions is to advise the executing agency even during the preparation of the project. When appraising a project KfW makes sure that the concept of the project is translatable into a promising undertaking. It also examines whether the projects make a contribution at justifiable costs towards improving the living conditions of the

people in the developing countries. Ecological and socio-economic aspects are also examined in detail.

With regard to the protection of the environment and natural resources FC has gained importance. Projects being implemented, which range from tropical forest protection to erosion control and afforestation rose between 1989 and 1998 to a commitment volume of about EUR 0.7 billion altogether.

Afforestation projects are characterised by a high complexity and their sustainability is dependent on numerous aspects. For example: the causes for overlogging and overexploitation of natural resources include aspects like population pressure and widespread poverty. They cannot be influenced by protecting tropical forests and through afforestations alone. The complex interrelation between population growth, poverty and the depletion of resources as well as the numerous groups involved (such as crop farmers, sedentary livestock farmers and nomads, commercial logging companies, ministries and local authorities) often make it difficult to find a consensus on the architecture of the projects that is acceptable to all groups of interest.

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Communicating, Financing, and Preserving Forests – Blueprint for an Integrated Conservation Strategy

Stefan Gössling

1. Background and introduction

It is the aim of this contribution to present an integrated strategy, which can link three different policies related to global forests:

- the need to preserve forest ecosystems (foremost in the tropics), and to finance and implement afforestation programs,
- the need to compensate for the ef-

fects of rapidly growing air traffic, most of all its contribution to global warming which, in turn, has ecological consequences for forests, and

- the need to foster society's consideration of the crucial role that forests play, especially with respect to their ecosystem services.

In the late 20th century, one of the main anthropogenic emission sources is air travel, which is the fastest growing traffic sector, and is responsible for about 5-6% of all emissions of carbon dioxide (CO₂) resulting from the com-

bustion of petrol products. Other gases released are nitrogen oxides (NO_x), and water vapour (H_2O). Emitted into the atmosphere, these trace gases change radiative forcing, and contribute to the greenhouse effect. Global warming is expected to cause increased die-off and decomposition of forest biomass, a process that could reinforce itself through multiple positive feedbacks.

To slow down climate change, it has been suggested to re- and afforest large areas, because trees store carbon (C) from the atmosphere via photosynthesis. Thus, new plantations could also reduce the temperature increases attributed to emissions from air travel. In such a scenario, air traffic would have to finance re- and afforestation programs, with newly planted trees sequestering C of the same order of the C-equivalent of trace gas emissions released into the atmosphere. Following this approach, individual flight distances and resulting emissions could be calculated on a per capita basis, and the costs incorporated into the retail price of flight tickets. The funds received from such contributions could be allocated for re- and afforestation programs. In return, each traveller could be provided with information on the importance of forests and their ecosystem functions. This information could foster environmental consciousness and render prominent the crucial role that forests play in e.g. global biogeochemical cycles.

Overall, the policy proposal, if adopted, will facilitate the linkage between the conservation of forests, the minimization of climatic effects as a consequence of air traffic, and the enhancement of knowledge on global environmental issues.

2. Air traffic

Since the 1960s, civil aviation has become an ever more important means of transport, especially on account of increasing international tourism. In 1996, 413.1 million passengers were transported by air globally, out of these 235.7 million tourists (excluding domestic flights, WTO 1998). Global air traffic consumed aviation fuels at a rate of 130–180 Mt yr^{-1} during the years 1992–95 (i.e. about 5–6% of all petrol products, the range being attributed to statistical insufficiencies), including a military frac-

tion of about 10–20% (Brasseur et al. 1998). Thus, civil aviation has consumed fuels of the order of 104 – 162 Mt in 1995.

When fossil fuels are burnt, they result in emissions of carbon dioxide (CO_2), nitrogen oxides (NO_x), water vapour (H_2O), hydrocarbons (HC), carbon monoxide (CO), soot (C), and sulphur compounds (mainly SO_2). The contribution of trace gas emissions to global warming is usually measured in terms of radiative forcing, which can be translated into an increase in global mean temperature. Since 1850, all anthropogenic emissions of CO_2 have caused an additional radiative forcing of about 1.6 Wm^{-2} (Schumann 1997). Global land and ocean surface temperature records show a temperature increase of about 0.6 K for the same period (IPCC 1996). With high probability, 50% of this warming are attributed to human alterations of the global carbon cycle, making CO_2 the most important anthropogenic greenhouse gas in the atmosphere. Presently, aviation contributes with 1.6–2.2% to all global anthropogenic CO_2 emissions. For all the aviation fuel consumed in the past, this translates into a radiative forcing of aircraft related CO_2 -emissions of about 0.02 Wm^{-2} (Schumann 1997).

Aircraft emissions need special consideration because they are released in 10–12 km height in the upper troposphere and lower stratosphere, i.e. in a region with relatively large residence times, low temperature, low background concentrations and large radiative sensitivity (Schumann 1994, Fabian and Kärcher 1997). Here, emissions have a larger impact on ozone, cloudiness, and radiative forcing than they do at the Earth's surface (Schumann 1994). Apart from CO_2 , the most important of these emissions are NO_x and H_2O . Nitrogen oxides from aircraft impact on the ozone distribution (e.g. Crutzen and Zimmermann 1996), with radiative forcing from present subsonic aviation due to tropospheric ozone increase being of the same order as from CO_2 (Brasseur et al. 1998). The direct effect of water vapour emitted by aircraft is likely to be negligible (Ponater et al. 1996), but the climatic impact of contrails and aerosols is potentially of larger magnitude than that of ozone or CO_2 . Minnis et al. (1999) calculate the radiative forcing of contrails at

0.02 Wm^{-2} (for 1992), while the impact of aerosols might be substantial, but remains poorly understood (Prather and Sausen 1999).

If added, all trace-gas emissions from present global aviation are estimated to cause a radiative forcing of the order of about 0.05 Wm^{-2} (Prather and Sausen 1999). Total radiative forcing caused by aviation may thus be 2–3 times that exerted by CO_2 alone (Fabian and Kärcher 1997, Prather and Sausen 1999).

Air traffic should also be considered in view of its large growth rates. Globally, it increased by 5–6% yr^{-1} from 1970 to 1993, and by 7.1 to 7.8% yr^{-1} from 1994–1996 (Pkm), with corresponding growth rates of fuel consumption being somewhat lower (Schumann 1997). Until 2015, fuel use growth rates of 3.9% yr^{-1} could lead to a demand of 270 Mt yr^{-1} excluding the military fraction (Schmitt and Brunner 1997). Since air traffic is growing faster than any other fossil fuel consuming sector, its relative contribution to atmospheric CO_2 -increase will also become larger in the future. The same is true for growing emissions of H_2O and NO_x (Fabian and Kärcher 1997, Grewe et al. 1999).

In total, air-traffic contributes with 0.11–0.15 Gt C to the build-up of carbon in the atmosphere, which accumulates at a total average rate of 3.3 ± 0.2 Gt C yr^{-1} (Kohlmaier and Rohner 1998). This seems to be a rather small proportion. However, only 5% of humanity participate in air traffic (Schallaböck 1997). Thus, emissions should be calculated on a per capita basis to understand their importance (Bach and Gössling 1996, Gössling 1997). On global average, flying consumes about 5.1 kg of fuel per 100 passenger kilometers (Pkm) (Brockhagen et al. 1997), with relative consumption being substantially higher on extremely short and long distances (> 5,000 Pkm), because large amounts of energy are used during take off and for carrying additional fuel on long-haul flights which adds to the total weight of the aircraft (Egli 1996, fig. 1).

Depending on distance, type of aircraft and occupancy rate, fuel use might range between 13.4 kg per 100 Pkm on extremely short distances, 4.0 kg on medium distances (4,000–5,000 km) and

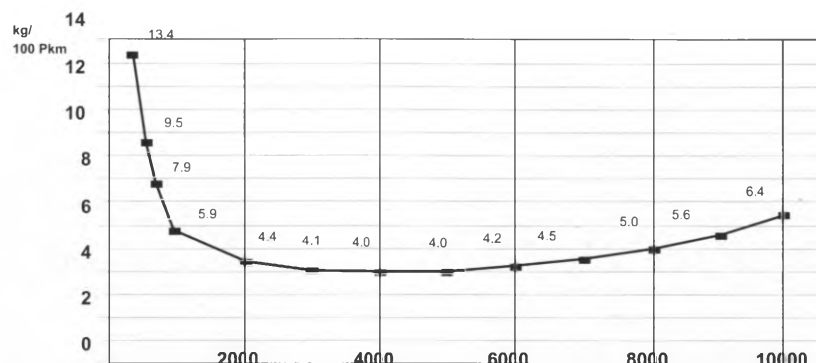


Fig. 1: Fuel use per 100 Pkm in relation to total flight distance

Source: Egli 1996

6.4 kg on long-haul flights. Typical journeys thus entail energy demands of, for example, 150 kg for 2,500 Pkm and more than 2,000 kg for 36,000 Pkm (return-flights). National connecting flights have to be added on top of this. The German Lufthansa (1995, personal communication) estimates that 70% of all passengers on international flights from Frankfurt have used national connecting flights, which adds another 50 kg of fuel to the per capita demand (Bach and Gössling 1996). Transport to the airport is not considered here, nor is energy used for the construction of airports, planes, etc.

The combustion of aviation fuel with the oxygen from the air results in 3.15 kg of CO₂ per kg of burnt fuel (Schumann 1997). On top of this, the aircraft emissions have to be weighted with a factor of 2-3 to account for ozone and contrail producing effects.

Basically, there are several possibilities to account for the environmental impacts of air travel. The common approach is to use economic models (e.g. Fankhauser 1994, Nordhaus 1993), which calculate the social costs of carbon emissions. These are equivalent to the pollution tax required to keep emissions below critical levels. However, economic models do not take into consideration that both the ecosystems and the climate system might react unpredictable to change, because they are complex, interacting, and dynamic systems. In fact, the social costs cannot be calculated, because damage to ecosystems (e.g. the loss of biodiversity) may be irreversible and the value of the life-supporting services of these ecosystems is ulti-

mately infinite (Costanza et al. 1997). A more appropriate strategy might therefore be to sequester carbon from the atmosphere. The most commonly suggested strategy are re- and afforestation programs, because trees fix atmospheric carbon through photosynthesis. According to this approach, carbon would be sequestered in new trees to the same extent it is emitted into the atmosphere (e.g. Brown et al. 1992, Cooper 1983, Detwiler and Hall 1988, Sedjo 1989).

3. The carbon cycle and the role of forests

The main reasons for CO₂-emissions are the burning of fossil fuels and changes in land use. In the period 1980-90, these contributed with 5.5 ± 0.5 Gt C yr⁻¹ (fuel combustion, 77%) and 1.6 ± 1.0 Gt C yr⁻¹ (deforestation and other land use changes, 23%) to carbon release (Kohlmaier and Rohner 1998). Out of the total release of about 7.1 Gt C yr⁻¹, approximately 3.8 Gt C yr⁻¹ are absorbed by the oceans and several other smaller sinks, especially forest ecosystems (Kolchugina and Vinson 1995, Schindler 1999). This points at the important role of forests in the global carbon cycle. Forests store about 1,146 Gt C in their plants and soils in contrast to 760 Gt C contained in the atmosphere (Dixon et al. 1994, Kohlmaier and Rohner 1998).

When forests are logged or burned, as it is the case with cattle ranching and small-scale agriculture in the humid tropics and fires in all forest zones, they release their carbon. Forest burning also releases other potent greenhouse gases like methane (CH₄) and nitrous oxide (N₂O) (Crutzen et al. 1984, Dixon and

Krankina 1993, Fearnside 1997). Global warming itself is expected to cause increased die-off and decomposition of forest biomass (Hulme and Viner 1995, Apps and Price 1996). This will apply especially for northern forests, where the process could reinforce itself through multiple positive feedbacks, e.g. changes in soil hydrology and mineralisation processes, enhanced emissions of carbon dioxide and methane from permafrost areas and tundra zones, and increased vulnerability to fires (e.g. Dixon and Krankina 1993, Goulden et al. 1998, Oechel et al. 1995, Kurz and Apps 1995). In the tropics, forests are increasingly threatened by acid precipitation and have in some areas become more vulnerable to fire, especially during extreme El Niño episodes (Nepstad et al. 1999, Rodhe 1994), when they may also become large sources of C to the atmosphere due to changes in precipitation, temperature, and soil moisture, resulting in decreased net primary production (Tian et al. 1998). Thus, climate change and deforestation are interacting processes with substantial potential to force each other.

Presently, forests cover 34 million km², about two thirds of their original expansion (FAO 1995). Temperate forests are in a steady state, but certain boreal forests have started to undergo extensive depletion (Apps and Price 1996, Kolchugina and Vinson 1995). Most threatened of all are the tropical forests, which declined by 154,000 km² yr⁻¹ between 1980-90 (FAO 1993). This rate underestimates true deforestation for some areas (Nepstad et al. 1999) and has possibly accelerated in the 1990s (Myers 1996).

Although forests cannot mitigate atmospheric carbon build-up indefinitely, they can be a substantial sink for C emissions. The basic options to increase stored C include to i) maintain existing C pools (to slow down deforestation and forest degradation, especially in the tropics), ii) to expand existing C sinks and pools through forest management, iii) to create new carbon sinks by expanding forest cover (afforestation and reforestation), and to iv) substitute renewable wood-based fuels for fossil fuels (Dixon et al. 1994, Hall and Scrase 1998). Here, re- and afforestation programs are considered to be the most suitable option to sequester the C-equivalent emitted by air-traffic, because they will also have important side-effects (restoration of ecosystem functions), which are of fundamental importance to DCs and can reduce the pressure on existing forests (Qureshi and Kumar 1996).

Basically, the amount of C that can be sequestered in vegetation and soil depends on the time scale, species planted, site conditions, disturbance, and management practices (Dixon et al. 1994). Forests can store additional C until they reach their climax-stadium, when sequestering and release of C reach an equilibrium.

On the basis of costs, technical suitability of land and biological potential of forest growth, the low latitudes offer the greatest potential for C conservation and sequestration (e.g. Lugo et al. 1988). Here, sufficiently large areas of land are available under economically, politically, and socially acceptable conditions (Grainger 1988, Iverson et al. 1993).

Weighted C densities for forest vegetation range from 99 t ha⁻¹ in tropical Africa to 174 t ha⁻¹ in tropical Asia, with some regions containing more than 250 t ha⁻¹. On global average, C densities of above-ground vegetation in tropical forests might be of the order of 121 t C ha⁻¹, compared to 64 t C ha⁻¹ in forests in the high latitudes, 57 t C ha⁻¹ in forests of the mid latitudes, and an overall global mean of 86 t C ha⁻¹. Carbon contained in tropical soils is of the same order as that of vegetation (123 t C ha⁻¹) (Dixon et al. 1994). Note that C densities vary regionally, and that there is a wide range of different estimates on C densities in the scientific literature

(e.g. Fearnside 1997, Brown et al. 1989, 1992, Brown and Lugo 1982, 1984, 1992, Winjum et al. 1992).

In the following, a sequestration potential of 120 t C ha⁻¹ is employed for the calculations. Furthermore, it is assumed that the trees planted need 40 years to increment the carbon (Faeth et al. 1994, Hall et al. 1991), even though a climax-stadium will usually be reached later (Nilsson and Schopfhauser 1995). The annual sequestration rate applied here would thus be 3.0 t C ha⁻¹. This compares with the global average of 2.7 t C ha⁻¹ yr⁻¹ given by Houghton et al. (1990), even though it has to be pointed out the mean annual biomass increment is not linear, but varies with tree species, age, and life-zone conditions (Lugo et al. 1988).

Carbon uptake by forest soils is substantial and might be of the order of 0.5 t C ha⁻¹ yr⁻¹ (Postel 1988). It is not considered here, because up to 25% of the C incremented in above-ground biomass might be lost again due to illegal felling, fire, insect damage, etc. (Faeth et al. 1994). Moreover, substantial amounts of fossil energy are needed to plant the trees (transportation, fertilizer, etc.), which are not taken into account either.

Overall, calculations are based on the assumption that the forests are not logged. However, if logging of afforested areas can preserve ecologically more valuable old stands, it might be a viable alternative.

Since emissions are released within hours, but sequestered over the life-

time of a tree, another aspect to be considered is the interval between emission and storage, which determines the build-up of additional atmospheric C. Thus, the ratio of release and uptake of C was computed in several scenarios over time. Sequestration within 20 years was found to be the most suitable alternative out of a climate protection perspective (Gössling 1999b).

The costs of re- and afforestation programs vary considerably, depending on the region and its socio-economic conditions, tree species, and planting methods. Postel and Heise (1988) estimate that the average costs in the tropics are of the order of 400 US\$ ha⁻¹, including the costs of seedlings, protection and cultivation measures. This translates into US\$ 3.3 per ton of C, if an average storage potential of 120 t C ha⁻¹ is assumed, and matches with the lower range of the figure of US\$ 0.03–13.64 t⁻¹ C given by Faeth et al. (1994) for six forestry projects in the tropics. In this study, average costs of US\$ 6.5 t⁻¹ C are taken as a basis, because the C has to be stored within 20 years, which involves costs twice as high.

However, the values given above do basically not include the costs for buying the afforestation area, infrastructure, and supplementing programs like agroforestry projects (Unruh et al. 1993, Kohlmaier and Rohner 1998). Further costs arise from administration, technical supervision and assistance, consultation and planning, site preparation, educational programs for both personnel and involved local residents, labor force, transport, building access roads, local

Tab. 1: Flight distances, fuel use, resulting CO₂-emissions and C-equivalents, and costs of re- and afforestation programs

Distance (one way, km)	Fuel use (kg) ¹⁾	CO ₂ -emissions (kg)			C-equi- valent (kg C) ³⁾	Re/af- forst. (m ²)	Costs re/ afforst. (US\$)	Add. costs (US\$) ⁴⁾	Sum costs (US\$)
		One way	Return flight	CO ₂ -equi- valent ²⁾					
1.000	60	190	380	950	260	43	1.70	0.90	2.60
2.000	90	280	560	1.400	380	63	2.50	1.30	3.80
3.000	125	390	780	1.950	530	88	3.40	1.90	5.30
4.000	160	500	1.000	2.500	680	113	4.40	2.40	6.80
5.000	200	630	1.260	3.150	860	143	5.60	3.00	8.60
6.000	250	790	1.580	3.950	1.080	180	7.00	3.80	10.80
7.000	315	990	1.980	4.950	1.350	225	8.80	4.70	13.50
8.000	400	1.260	2.520	6.300	1.720	287	11.20	6.00	17.20
9.000	505	1.590	3.180	7.950	2.170	362	14.10	7.60	21.70
10.000	640	2.020	4.040	10.100	2.750	458	17.90	9.60	27.50

¹⁾ fuel use on a one-way flight, rounded after Egli 1996, ²⁾ x 2.5 to include the effects of NO_x and H₂O, ³⁾ 1 t CO₂ has a mass fraction of about 272 kg C, ⁴⁾ additional costs arising from social projects, etc.

organisation, weeding and thinning, fire protection, monitoring, and social projects. These costs are often ignored, even though they are crucial to ensure the success of the project (Evans 1986, Kowero and Temu 1985, Swisher 1992). Here, a figure of US\$ 3.5 t⁻¹ C is applied for additional costs, corresponding to about 50% of the costs of re- and afforestation itself. This might be a conservative estimate, because some costs are recurring over the life-time of the project.

Table 1 shows the total costs for re- and afforestation programs depending on flight-distances and related emissions.

It has been shown that fuel consumption is higher on short and long distances and does thus not increase linearly with distance. Therefore, the use of fuel is calculated according to the specific use on one-way distances (columns 1 and 2). In the following, the fuel use is converted into CO₂-emissions (emission index: 3.15 kg CO₂/kg fuel) and doubled to account for the return flight. The resulting value has to be multiplied with a factor of 2.5 due to the additional warming effect of NO_x and H₂O. Finally, the CO₂-equivalent has to be divided by 3.67 to arrive at the C-equivalent.

Reforested land can sequester 6 kg C m⁻² within 20 years. This value serves as basis for the calculations of the area needed to offset the C-equivalent and the costs involved (US\$ 6.5 plus US\$ 3.5 t⁻¹ C). In total, compensation costs will be of the order of US\$ 2.60-27.50 for flight distances between 2,000 and 20,000 km (return-flights). Note that these values do not include the costs of organizing and administrating the financial resources. Moreover, with the available area for re- and afforestation programs decreasing, afforestation costs might rise in the future.

3. Communication

Many of the problems societies face in formulating sound environmental policies stem from the lack of recognition of the crucial roles that ecosystems play (Daily 1997). Ecosystems provide services essential to humanity, which in short can be described as supporting life, supplying materials and energy, and absorbing waste products. These services include e.g. the provision of bioenergy,

wood, pharmaceuticals, and habitat for other species; the protection of carbon in vegetation and soils, the prevention of erosion, the preservation of watershed functions and the regulation of water flows, the stabilization of global biogeochemical cycles, the buffering against the spread of pests and diseases, and recreation opportunities (e.g. Myers 1997).

Knowledge about forest services enhances the willingness to contribute to the conservation of forests. A recent survey (Gössling 1998, unpublished data) investigating willingness-to-pay of residents of the city of Münster (Germany) to preserve tropical rainforests revealed that substantial amounts of money could be allocated for conservation purposes, with annual per capita willingness-to-pay reaching almost US\$ 50 on average. It was also found that willingness-to-pay was positively correlated with knowledge on the ecological services provided by tropical rainforests.

To spread information on forests, aircraft passengers could be provided with information on the state (and importance) of the world's forests. To achieve this, the amount of money charged for re- and afforestation programs could be printed out on flight-tickets, and brochures or booklets containing information on forest functions and the climate system could be distributed via travel agencies or during flights.

4. Conclusions

Overall, the policy proposal presented here could facilitate the linkage between the conservation of forests, the minimization of climatic effects as a consequence of air traffic, and the enhancement of knowledge on global environmental issues. Moreover, it could have a range of positive side effects like the reduction of pressure on the existing forests and the restoration of ecosystem services.

Nevertheless, it seems to be important to render prominent the limits of this strategy. Afforestation programs could slow down the accumulation of C in the atmosphere, but they are no means to compensate for the environmental damage caused by e.g. acid precipitation and nitrogen deposition, which already

puts substantial stress on, for example, oligotrophic and ombrotrophic ecosystems (Bobbink et al. 1998, Heath et al. 1993). Similar is true for changes in stratospheric gas composition and air chemistry. Moreover, re- and afforestation programs do not address the problem of the accelerating consumption of finite resources like fossil fuels, and they do not substitute for their use. Finally, the area that can be afforested is limited. Re- and afforestation programs are thus a short-term strategy to mitigate the effects of air travel. Overall, aviation should thus be seen as an activity in need of limitation.

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Podium Discussion: The Role of the Media in Environmental Communication

The Debate on Sustainable Forestry in the Media of the Czech Republic

Jan Cerovský

Introduction

For this session of the World Forest Forum, I have promised a contribution on the role of media in providing information about sustainable forestry in my country – the Czech Republic. Then I was asked to do an introduction to the whole morning session. Therefore I am taking the liberty of placing my report into a broader context of environmental journalism. I am using the term *environmental journalism*, because forest management, and sustainable forest management in particular, must be considered in the framework of the entire environmental conservation.

Please do not take my statements as some final conclusions: just on the contrary, my intention is to present them as open-ended questions for our discussion. In this discussion we all together should seek to identify reasons for situations which we cannot be satisfied with, and try to find solutions or – better – suggestions for action how to improve the present status.

What is wrong with the majority of media, respectively with the major and therefore just most influential media? Let me explain this by a case which actually had happened not long ago. The Krivoklátsko Biosphere Reserve and Protected Landscape Area protecting significant, rich and varied in biodiversity forest ecosystems of Central Europe in Central Bohemia, proposed to be upgraded to the fifth national park in the Czech Republic, celebrated recently its twentieth anniversary. The Head of the BR and PLA Administration was promised by a moderator from a leading TV company they would come to the event and make a short report to be trans-

mitted. But after all, the TV people did not appear. The disappointed colleague called the lady moderator who had made the promise. „Yes, I wanted to come,” she did insist, „but my boss cancelled it”. „Well, now if I told you a murder has been committed here and a dead body is to be seen under the Krivoklát bridge, would you come?” reacted my friend. – „In that case I am absolutely sure we would,” was the answer.

I am often posing to myself – and now also to you – the following questions:

Why the position of the environment is still generally marginal in the media in spite of its social relevance?

Is it really true that public at large is not interested in information which is correct, instructive, not controversial or sensational, or is this only an opinion – perhaps a false one – of the media people?

Or has not yet a correct manner been found how to use the media for spreading serious information and encourage participation?

Case Studies

It would, however, be wrong to say that the media are not paying any attention to environmental problems. Environmental journalism has developed, although its position in the media generally still remains minor and less attractive one. Topics receiving priority coverage in press, broadcast and television are those from politics, business and society, gossip about V.I.Ps seems to be particularly popular. This preferable

choice also might be the reason, why media do prefer to deal with scandalous affairs concerning the environment. This seems to me a specially strong approach in the countries of Central and Eastern Europe.

In this context, I would like to mention two topics which have recently obtained a rather high attention from the side of media of all kinds in my country, the Czech Republic.

The first topic is the **reprivatization of forests and connected timber exploitation**. The former private owners are getting back the forests they or their ancestors had owned decades ago, before the communist “nationalization”. Many of them, however, are not interested in forest management: they are too old, have moved to towns, are executing other professions etc. Private companies are buying such forests and selling them farther, after having had them depleted. The whole procedure making use of gaps in the Czech legislation brings big profits to some few people, while depriving the country and its broad population of valuable and beneficial natural resource. Some media are reporting about and investigating such cases. This is information about a controversial, even scandalous topic, but surely providing a good service to resource and generally also biodiversity protection.

The second topic is the **wood cutting in the Šumava National Park**. The park, established along the Austrian and German frontiers with the Czech Republic after the fall of the „Iron Curtain” has been invaded by the bark beetle, this invasion growing into a really catastrophic dimension also due to some conservationists’ opinion the forests in a national park should be left to natural processes only. The National Park, however, contains mainly altered forest ecosystems, spruce plantations, and the bark beetle achieved a dangerous scale threatening the surrounding not protected forests, and thus provoking voices

requesting to cancel the National Park and to amend dramatically the present very good Nature and Landscape Protection Act. The controversy – to cut the sick trees or to leave them? to which extent? etc. has moved from debates among scientists, foresters and conservationists to newspaper and magazine pages, broadcast programmes and television screens. That certainly would be not wrong, but some journalists and writers without proper knowledge about nature, ecology, conservation, environment and forest management started to promote unrealistic and wrong views, thus desinforming and confusing public at large, and partly turning its opinion against conservationists and forest managers.

The Role of the Media

In our century, the human mind and activities have become the most important driver in impacting the Biosphere of our Earth. Currently too, the media – press, broadcast, television and most recently also the internet – have developed into the most influential factor shaping the human mind and activities.

What really should be the role of media? The ethics of journalism declares media should spread correct, precise information, not to try to change in any direction the course of affairs. The work of media should not be mixed up with the function of lobbies, although lobbies actually would certainly use media or try to do so – and certainly with success.

How far is it ethical and therefore acceptable for media to encourage participation: where does promotion of a right vision and mission finish and lobbying does start? How to determine, whether media present a right information, when conservationists, scientists and managers are among themselves controversial about the issue?

How should a correct environmental journalist look like?

He or she should have some basic **knowledge** in the field he or she is writing about, or at least know where to find trustworthy information to base his or her work on it.

Another important prerequisite would be to **be independent**; this is particularly difficult, especially in countries with strong corruption (where sometimes it is even quite difficult to find an independent consulting expert!).

Essential is a **right approach to reader/listener/viewer** as for intelligence, knowledge (both have not to be underestimated nor overestimated) and also the amount of information (“a lot is sometimes too much” an old Czech proverb says).

Another matter to be considered and decided on very carefully is the **kind of information**. What now public at large dislikes, is to be overfed by environmental “Doomsday” prophecies: it has been clearly proved that such an oversupply rather alerts people against environmentalists and conservation. Neither less important or even doubtful issues should deserve attention. It is no-good service to environmental protection and resource conservation, if the media of a locked continental country devote long reports to wildlife conservationists protesting against the killing of whales. Some time ago in the Czech Republic a small group of people fighting cruelty against animals was trying, in a very dramatic way, to stop the “suffering animals” – horses during a horse race. The action did receive a big publicity in media which called them “ecologists”. Thus of course the media have seriously discredited the image of ecologists and environmentalists among broad general public.

As also the Czech case of wood cutting in the Šumava National Park has shown, many people are getting upset with the patronising or even dictatorial behaviour of some environmental fundamentalists. Such behaviour, often with no scientific-technical, but rather with a purely emotional motivation, contributes to what is now called by conservationists in Poland an “environmental contra-revolution”, and by conservation opponents in the Czech Republic “fight against the green totalitarianism”.

I personally think the message in the media should be **positive**, show as priorities cases with environmentally prosperous results, achievements reached with the support of public participation. The messages should be based more on positive values (benefits, beauties) than on discouraging negative facts (environmental blunders and disasters – which of course does not mean to close eyes over the latter ones).

And once more again: all that what has been generally said about *environment*, applies also to *forests* and *forest management*. In their relation to society, the latter ones are vital components of environment and environmental conservation.

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The Dog Attends to his Master, not the Other Way Around

Frank Griesel

When I received the invitation to contribute to this discussion, I was wondering for a moment and thought, well "the media's role in environmental communication"? Would it be more accurate to put word the question in another way: "The role forest and societies take in the media"?

To contribute something meaningful, I decided on doing a little experiment. I took the German print media with the highest print run and the highest circulation, the 5 most common news magazines (Bild am Sonntag, STERN, Spiegel, Focus, Bunte and furthermore Die Woche and Die Zeit), in addition to five large science/nature magazines (Geo, P.M., ein Herz für Tiere, Spektrum der Wissenschaft, Natur/Kosmos) and the five largest news papers (Bild, Süddeutsche Zeitung, F.A.Z., Die Welt, Frankfurter Rundschau). I collected all articles containing the terms forest, forest management and forestry over a period of three months, from August to October.

Even though the data base is rather small, I do not think the tendency would be much different, taking a broader data base. The results of the experiment might be surprising on one hand, but they show the old predetermined media patterns on the other hand. The conclusions taken from 64 articles (I might not have caught them all) are summed up as follows:

Conclusions:

1. Forest management is not a topic, I found the term in very few articles
- 1a. The forest itself however is a topic.

Does this mean that the media is interested in forests but not in forest management?

2. The term forestry is not mentioned in any positive context. Some examples found are "The axe in the forest" (Discussion on national parks/nature park Kellerwald/ Die Woche), "We are talking about the heritage of the wilderness" (on forest exploitation in B.C./ S.Z.) or, a special example, "Authorities, nobody needs" (Federal Research Centre for Agriculture and Forestry, and the Federal Research Centre for Forestry and Forest Products, BamS)

Looking closer at the subject the media seems to take the individual forester working in the woods, in contrast to the administration, as a rather competent individual.

3. The by far most mentioned topics are:
 - protection of endangered species/ protection of animals
 - nature conservation- tropical forests
 - hunting- forest fires
 - forest die-back
 Farther behind followed by:
 - ecosystem research/climate

Ergo animals, exotic topics, disasters and home country are best received!

4. I furthermore searched the internet and found: The most instructive pages dealing with the topic forest are not published by the Forest Administration but by Nature Conservation Organisations.

5. Possible answers are:

- Doesn't the administration have anything to say? I don't even mean that in a political sense, but do they not have a message, no visions and corresponding to that, do they not have to proclaim a message?

- Doesn't the Forest Administration give any objects worth writing about to the journalists? Opportunities do exist in abundance, take the forest die-back, the wild bore plague, natural forest research or hunting.
- Does the forest administration lack competent and professional personal (that was not transferred to the position for disciplinary reasons, but are real professionals), to deal with the media?

Germany has about 600 "audience magazines", 400 daily news papers, 1000 periodicals, 30 weekly newspapers, 1100 free papers, 30 TV channels and about 170 radio stations. This is the highest variety in terms of media in Europe and the tendency to a further splitting is still ongoing.

Answers:

Can we learn anything from what we have heard so far?

- Society is interested in the forest and its problems
- There is no concrete picture or concept of the forest in the media
- The Media does not have to get to the forest but the forest has to come to the media
- In how far can the media stimulate the active involvement of people in issues concerning the forest? Is that the wrong question? The question has to be: "What can the forest or the administering authority contribute to catch people's interest in the forest!"

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German Forestry in the Internet

Ernst Kürsten

Abstract

The internet is a new medium for information and communication. In Germany it is being used in a dramatically increasing intensity. In 1999 the number of internet users reached about 10 million. In just two years this number is expected to double. More and more people get accustomed to use the internet as a reference book or better as a library. This is especially true for groups of the population that are of distinctive importance for public relation activities: journalists and teachers.

German forestry actually is using the internet neither consequently nor efficiently. Some of the best sites are offered by the Federal Ministry of Agriculture (<http://www.bml.de/>) and the corresponding ministries of Bavaria (<http://www.forst.bayern.de/>) and Lower Saxony (<http://www.forstnds.de/>). Also local forest offices and several organisations are offering some information about forestry. A pathway to most of this different offers is provided by a federal organisation called ZADI (<http://www.dainet.de/>). In contrast it is very hard to find good sources of forestry information by search engines.

Generally it can be said, that information about forestry in Germany in the internet actually is not easy to find, not going very much into detail, sparsely linked and it is missing interactive elements like games and discussion groups. Progress may be expected by the activities of the "Internationale Holzboerse" (www.ihb.de www.timber-exchange.com) "the independent and most frequented portal for timber & forest world-wide".

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Massmedia Facing the Deforestation Problem in Albania

Xhemal Mato

The Present State of Forests

During the totalitarian state period, forests were protected more by the sedate phantom of the state than the laws. But in the 90s, when Albania entered the stage of political system changes, even the forests were exhaustively exposed to massive destruction. The sedate phantom of the state and the "sound opinion" of the communist system broke together with their symbolising monuments. The new state in the meantime aimed at a legal authority, but it lacked the necessary laws. At the same time, the "free initiative of the individual" started to be ascertained in the new economic system. This initiative had been pending up for a long time and was extremely inclined to burst out. But it exploded into a "bad freedom" and boomed at the detriment of nature and the life of trees, in particular.

The so-called "social sound opinion" successfully prevailing in 50 years, was

actually found without the ideological uniform providing strength to it. The "new civil ethics" which started to emerge was encountered since its initial steps, with massive illegal actions and extensive corruption in the state administration.

Under these conditions, the ethics did not dare to walk in the streets or throughout the country, but was satisfied in seminar halls, dressed up in professors' suits. The general social interest very rapidly began to shed into the holly personal interest, which realised that in this time, if natural resources were exploited, if trees were cut down, the profit was 100%. Because they did not have any owner, you did not have to pay anything to buy them or to pay the tax for using them. There was no need to work for them, because nature had worked for decades and had performed an excellent job. Thus, they should be exploited as soon as possible, for as long as the transition period would last. This psychology that set off in the trans-

formation years in Albania, could be expressed in the massive exclamation call "Let's rip off as much as possible from nature, because it belonged to the Monist State. Now it is totally ours. The people who planted and took care of these trees do not live anymore, the actual government has no time to deal with us, while those that will come after them, can not judge us anymore."

This psychology prevailed in a part of the population and led to massive nature destruction in the first 4-5 years of transition. It often happened that the revolt against poverty caused by the totalitarian system was demonstrated in "chartist" hatred towards everything created in the previous regime. The main victims were mostly forests, national parks, green surface areas in cities, plantations and orchards, vineyards, animals etc. During the first two years of transition e.g. the elm forest in Ishem (Rodon), pine forest in Kuben (Kukes), chestnut forest in Shishtavec, forest reserve of Rushkulli etc. were exploited.

A concrete indicator of the forest damages are tens of law suits made by the relevant bodies, but only 7.2% of them were judged by the court and only 16.2% of the violators were made to compensate the damages (State of the

Environment Report 1993-1994). According to this report, published by the National Environmental Agency (Committee of Environmental Protection at that time), the forest fund, at the end of 1993 was 1034300 ha (36% country's forest area), which means a reduction of about 3700 ha, in comparison with 1992. The same report emphasises that "The main causes of forest damages and forest fund reduction relate to their abusive cutting for fuelwood and construction especially in the forests near villages and on the sides of national roads, as well as to over-pasturing and fire outbreaks."

Articles and Chronicles on Nature Protection in 1991-1995

On the other hand, the massive ignorance cultivated in the field of environmental culture prevailed in every place and in action. The most efficient means to help with this situation was the professional environmental media. In the meantime, the most dangerous means for this situation was the non-professional media which was due to servility. Small personal interests or ignorance, very often advertised soap for cheese (deceiving) or did the contrary, made the fly a bull (exaggerating). If we compare the article and information provided by radio television, in relation to nature protection, with those on environmental protection in general, it comes out that the first ones occupy about 60% of the general environmental protection publications. Most of the articles relate to the protection of forest and trees.

The ratio of articles on environment with those on nature in the three main national newspapers, *Koha Jone* (Our Time), *Zeri i Popullit* (People's Voice), *Rilindja Demokratike* (Democratic Renaissance) is as follows: "*Koha Jone*" 15, "*Zeri i Popullit*" 26 and "*Rilindja Demokratike*" 15.

At the same time the Albanian Television counts 47 chronicles and news, as well as 8 documentary films.

The most evident articles for the protection of forests and trees, worth mentioning are:

"*Koha Jone*" newspaper:

1. "Albanian fruitculture towards total destruction". (A.Tozaj).

2. "Have our forests really been sold to Italy?" (B.Dybeli).
3. "From South to North – fires in Albania (?)"
4. "Forest police has straw keys (possesses nothing)". (Xh.Shyti)
5. "Mirdita -1500 m³ wood logs are cut in a day" (J.Marena)
6. "Forests are barbarously cut down" (The Association for the Natural Environment Protection) etc.

"*Zeri i Popullit*" newspaper:

1. "Don't forget forest, governmental gentlemen!" (M.Meta)
2. "What's left by the axe, is burnt by the fires" (M.Meta)
3. "Where is forestry police?" (V.Legisi)
4. "Misery of forests, misery of people" (E.Cenolli)
5. "Olive that challenges centuries, found it hard with the Meksi government" (P.Dhimitri)
6. "Barbarian destruction of Albanian orchards" (B.Hodo)

"*Rilindja Demokratike*" newspaper:

1. "The approval of the law on forestry finds our forests in a afflicted state" (M.Meta)
2. "Days of St.Bartolomeu for trees on road sides" (Xh. M)
3. "Laws that cut the forests" (M.Zefi)
4. "S.O.S. in the Albanian orchards" (P.Sotiri)
5. "Forests are exterminating, is there a solution to save them?" (M.Meta)

The environmental Status Report 1993-1994 states: "Public information through mass media, especially through television has considerably increased. This increase has positively affected environmental education and awareness of the public. This has been expressed in the growing interest of the public to attend programs and information related to environmental protection, consequences and risks resulting from its damages".

The ratio of the publications for nature protection with those for forests protection Albanian TV has made 46 chronicles and produced 8 documentaries on forest protection, while the three newspapers under survey have published 59 articles. By comparing their number with articles published on other issues, it turns out that about 10 times more have been written or filmed for

forests in these years.

But how it can be explained that despite the massmedia work, massive illegal cuttings of trees in cities and road sides were not prevented, uncontrolled cutting of forests and orchards was not hampered, fires in forests were not stopped (instead they strangely increased)? Maybe massmedia was not efficient enough? Maybe appeals in newspapers and television fell on deaf ears? Maybe the public should be left to walk in the primitive way of learning by suffering first?

As a TV journalist, it has often happened that tele-viewers after having watched my TV chronicles on environment stop me in the street and say: "Whom are telling all this?" Or "It is useless, these people do not understand." or "It is right what you say but it falls in deaf ears." And my response is "You are not deaf since you stop to talk with me". Then who is the "deaf ear" for the destruction of the environment, the people, the police, the law or all of us who do not hear well?

Most appropriate for this case would be the saying: "There is not deafer than the one who does not want to hear". One day I was desperately speaking with an old professor on the damages made to the Albanian environment, despite the continuous efforts of media to raise public awareness. He told me: "Don't worry, awareness needs years, not days to be achieved".

Media in this issue resembles Nastradin's violin anecdote. Nastradin together with his friend was robbing a shop. When people passed by, Nastradin made as if he was playing the violin to hide the theft they were making. But the violin had no strings. Then people asked why his music was not heard and his reply was "Aa! This music will be heard tomorrow". Indeed, this is what it is really happening with environmental awareness in our country. Its music has started to be heard.

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The Image of the Forests in the Romanian Media During the Transition to Market Economy

Dan Stoica

Abstract

A recent governmental report issued a couple of months ago is stating that about two million cubic metres of wood have been illegally logged in the period between 1990 and 1998. The estimated loss through illegal logging, deforestation, abusive overgrazing and other activities raise to about 22 million USD. This news appeared in the media exactly one month ago, ten years after the fall of the communist regime in Romania.

Reading this one could ask where has the media been all this time, how could this happen unnoticed before our eyes and, of course, if a better coverage of this issue could have prevented this phenomenon from happening?

After the fall of the communist regime, one of the hottest issue around the forests was the retrocession of the forestland to its former owners. This was done starting with 1991 but the area retrocede has been limited to one hectare per owner and family. Over 300,000 hectares of forest were given

back to their owners while little attention was paid to the legal frame for the protection of private forests or to the enforcing of the existing legislation. This situation combined with the economic crisis and the corruption of the foresters has lead to the disappearance of over 60% of the private forests. The wood resulted from illegal cutting has been either used by the owners themselves or sold to private companies.

Little attention has been paid to the ecological consequences of this situation. The forest became a topic for the new media only occasionally, when the police or forest authorities discovered the illegal cutting of trees from private or state owned forests or the acts of corruption of the forest authority employees. Little attention has been paid to a permanent information of the public about the ecological, natural, social or cultural value of the forest. Insufficient investigative reporting has been dedicated to the complexity of forest protection during the transition period.

Print media and the national public radio have approached this issue more

constantly than the TV programs which would have had, definitely, a greater impact on the audience. It seems that, during the transition period, environment is not one of the favourite issues of the media who focuses its attention to the political, economic and social aspects of the transition. As a consequence, media has little influence on the individual experience with forest at the present time.

And this is a worrisome conclusion taking into consideration the fact that, recently, the Romanian Parliament has passed a law that stipulates that the former owners of forest and their families will be entitled to enter into the possession of up to 10 hectares of forestland. While this is a great step forward to repairing the injustice made during the communist regime it will certainly raise many problems, even greater than those existing now, to the protection of the forest. And if the media will not involve with responsibility in approaching this issue, in the future I am afraid we will report very sad stories about the Romanian forest.

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Podium Discussion: Methods to Raise Public Awareness and Strategies to Strengthen Public Participation in Forest Issues

Pro Public Participation: Potentials and Pitfalls

Jens Brüggemann

Introduction

Like other international processes dealing with forests, the 'Forests in Focus' project identified the need for greater stakeholder involvement in decision making:

"Local communities require further empowerment as their support and participation in the management of their resources is essential if resource management initiatives are to be successful. Demonstration projects have an important role in fostering the local acceptance of many environmentally-friendly management practices." (Forests and Atmosphere-Water-Soil, July 1999)

The forum 'Forests as Source of Raw Materials, May 1999, identified "five key requirements for sustainable forest management:

- (a) political will and co-operation with environmental and social non-governmental organisations and industry;
- (b) appropriate forest education, research and extension services,
- (c) people's participation in planning, managing and benefiting from forests;
- (d) appropriate institutional frameworks (law, tenure, tax, etc.); and
- (e) improved information on the extent, quality, value, management, use and conservation of forests."

The issue of public participation also emerged as a dominating theme during the forum 'Biodiversity – Treasures in the World's Forests, July 1998:

"It is ... recommended that bio-regional approaches be adopted for conservation planning **with full participation**

of all concerned people in order to optimise all products and services of forests and achieve better allocation of land."

"It is recommended that Integrated Conservation and Development Programs approaches **should be led by local communities and not imposed upon them** and that the likelihood of ICDPs succeeding will be enhanced if they are based upon local understanding and valuation of biodiversity."

"It is recommended that bio-prospecting be promoted as a legitimate way to access a valuable natural resource but that institutional arrangements to ensure the **equitable sharing of benefits** be further studied and where appropriate strengthened."

"It is recommended that greater attention be given to the sustainability of Non Timber Forest Products resources in multiple-use systems and that the **interests of the people who depend upon them be given greater weight in decisions** relating to the use of forest lands."

Potential and Pitfalls

The conference on biodiversity in forests claimed "Community participation in biodiversity conservation is a crucial tool for success across many types of forests and forest uses." This claim parallels the intentions of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice, June 1998: "Public must be entitled to participate in decision-making to assert right to healthy environment."

At the same time people are seen as intruders to nature conservation. The biodiversity forum stated:

"Protected areas allocated primarily for biodiversity will remain a central element of conservation. It is recommended that renewed efforts be made under the CBD and IFF to achieve the medium-term security of **a core set of forests sites of recognised international value** for forest biodiversity ..."

"Scientists must recognise that the existing biodiversity paradigm has in the past been **misused to alienate and disenfranchise peoples from their spiritual and natural resources** and that future scientific endeavours must be built upon **recognition of basic rights and recognition of traditional ecological knowledge.**"

We are facing a dilemma:

- participation tends to favour user groups
- conservation and sustainable forest management are not feasible without participation

This dilemma is mirrored in the typology of participation:

Manipulative Participation: Participation is a pretence with people's representatives on official boards but unelected and having no power.

Passive Participation: People participate by being told what has been decided or has already happened. It involves unilateral announcements by an administration or project management without listening to people's responses. The information being shared belongs only to external professionals.

Participation by Consultation: People participate by being consulted or by answering questions. External agents define problems and information-gathering processes, and so control analysis. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to take on board people's views.

Participation for Material Incentives: People participate by contributing resources, for example labour, in return for food, cash or other material incentives. Farmers may provide the fields

and labour, but are involved in neither experimentation nor the process of learning. This is commonly called participation, yet people have no stake in prolonging technologies or practices when the incentives end.

Functional Participation: Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet predetermined objectives related to the project. Such involvement may be interactive and involve shared decision-making, but tends to arise only after major decisions have already been made by external agents. At worst, local people may still only be opted to serve external goals.

Interactive Participation: People participate in joint analysis, development of action plans and formation or strengthening of local institutions. Participation is seen as a right, not just the means to achieve project goals. The process interdisciplinary methodologies that seek multiple perspectives and make use of systemic and structured learning processes. As groups take control over local decisions and determine how available resources are used, so they have a stake in maintaining structures or practices.

Self-mobilisation: People participate by taking initiatives independently of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Self-mobilisation can spread if governments and NGOs provide an enabling framework of support. Such self-initiated mobilisation may or may not challenge existing distributions of wealth and power.

(from: "Participatory Forestry: The process of Change in India and Nepal" by Mary Hobky. ODI Rural Development Forestry Study Guide 3.)

Procedures for Consensus Building and Understanding

Formal procedures are

- Hearing
- Advisory Board
- Committee
- Citizen Vote

Informal procedures are

- Mediation
- Fishbowl
- Round Table

Future Search Conference

Major rules for participation procedures oriented towards consensus building and understanding include:

Clear Mandate: The "raison d'être", key questions and roles and competencies need to be clear at the beginning and accepted by each participant.

Time: A clear timetable allows all participants to estimate and accept the duration of their input. There needs to be sufficient time allocated for discussing the subject.

Openness of the Result: No party is allowed to present their previously taken decision as a result of the discourse. Participants need to be ready to accept a different, higher ranked option than their own.

Equal Rights and Responsibility: Every participant has the same position within the procedure. Hierarchy or power relations outside of the discourse do not justify any special treatment or privileges within the participation procedure.

Knowledge and Learning: Relevant knowledge needs to be mobilised for the participants. All parties need to be ready to learn from expertise and arguments of others.

Rationality: Emotional outbreaks and moral condemnations of positions usually block possibilities of consensus building. They need to be avoided or translated into arguments that can be communicated.

Feedback: Intermediate and final results need to be made public. The transparency of the procedure is an essential element of its legitimacy.

The dimensions that have to be taken into consideration are:

Time: long term, medium term, short term

Space: communal, regional, national/international

Type of conflict: open, latent, conflict free

(according to Beckmann and Keck (1999): "Beteiligungsverfahren in Theorie und Anwendung". Akademie für Technikfolgenabschätzung in Baden Württemberg, Stuttgart.)

Conclusion

Public participation in forestry decisions has a huge potential and should be seen as a right in itself. **But:**

- participation can be a pretence for conducting people
- not everyone can participate at the same level
- some procedures can be costly, time consuming and inappropriate to the situation

Therefore, some questions should be answered in advance of the process:

Which form of participation?: **individually, as an organisation, establish a new organisation, community leaders, by gender, by ethnic groups, as a community**

Whom do I involve?: indigenous communities, migrant peasants, farmers, fishermen, women, youth, without distinction

In what do I involve them?: design, implementation, follow-up, evaluation

For what do I involve them?: **to inform them, to motivate them, to oblige them to take part, to consult them, to plan jointly**

How do I involve them?: directly, through education, through incentives, in dialogues, through consultations

What do I do to improve participation?: nothing, to speak with people, to contract an expert, to evaluate and get to know experiences, to look out for allies, to find resources

What is participation aiming at?: **to spend time and money, to provide work for consultants, to get lost with theories, to improve the project, to comply with conservation objectives**

What do I want from participation?: to reduce the implementation costs, to get cheap labour force, that the people get ownership of the project, that they do not create problems, that the project improves

Why do they relate to me????: to ask for things, to ask for advice, so that I improve their capacities, so that I do not bother them, to embark on joint planning

(taken from: GTZI LISTRA (1998): "Taller Regional Latinoamericano sobre Zonas Periféricas", Tena/ Ecuador, 7. – 15.3.1998)

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Forestry between Participation and State Management. Case Studies from Mexico, Guatemala, India. Pleading for a Change in Paradigms.

Jürgen Pretzsch

Abstract

The relation between human being and its forest environment is dominated by influences from outside the forest sector. If forest programs are implemented this has to be taken in account. It makes the implementation process very difficult. The dependence of tropical forestry development from the guiding general development policy is shown in a simplified six stages approach. The diagnosed stages are traditional forest use, colonial forest use, forest use as an accelerator for economic growth, internationalisation of forest policy, polarisation of forest policy and the actual era of forest privatisation and market orientation.

The stage model expresses the paradigmatic shift in attitudes towards tropical forest development. It is useful for understanding the actual situation. Forest policy makers are confronted with an increasing number of different actors demands in post industrial societies. In many tropical countries the introduced paradigm of scientific forestry to a wide extend is still purely technology oriented. Conflicts between state forest administrations, having internalised this paradigm, and the different actors arise. The call for more participation alone is not helpful to resolve the problems, as the regulating function of the state is needed to cover forest related social benefits and to avoid social costs.

Three case studies are presented to learn from conflict situations and to elaborate scenarios for future development options. The case of the resin tapers in the highlands of Guatemala shows that forest management problems can hardly be solved by short term project interventions, even if these are planned and implemented in a participatory way. The second case study deals

with the development of Ejido-based forest management organisation in the tropical forest of Quintana Roo/Mexico. It can be learned that planned change makes only sense in a very specific situation if there is really space for development alternatives. This is especially the case if power relations are changing. A complex strategic planning approach is necessary to conduct the implementation process. Objectives have to be continuously discussed among all involved actors. The third case study is dealing with forest politics in Thailand and India: the relation between state forest administration, rural population and other allied actors is analysed. It can be observed, that interest and power are the main factors which determine forest policy objectives in the magic triangle between industrialisation, basic needs and conservation oriented forest management. Paradigmatic shifts are hardly anticipated by the forest administration; but the reverse is the case. Forest policy often is adapting to the politics process too late. That also means that the state administration has not used the possibility to organise the necessary dispute. In the case of India and Thailand this leads to more and more isolation of the state forest administration.

It is resumed, that obviously the effects of local forest management projects and environmental education measures are overvalued. In many cases socio-economic framework conditions and related options for change are not really given. Forest management approaches with their European origin often have a rather technological character, but their implementation is first of all a political issue and an integration in general policy processes is necessary. In most cases planned change towards more sustainable forestry requires the involvement of super-ordinate levels and it has to be related to a broader

process of social change. The necessary paradigmatic shift should give more space for the participation of all groups of society towards forest management decisions. The function of state administration has to be reformulated and, by this way, reinforced. The new generation of foresters has to look ahead and learn more about the use of social science instruments and action orientation.

1. Genesis of development and diagnostics

Understanding forest development, its objectives and underlying paradigms is the base for any program development. So first a socio-economic diagnosis is necessary, which is the result of a comparison between the historically based reality and an ex post developed program (GIERSCH 1961). The program follows the attitude and objective system of the analyst. In forest development this can be dominated by three main objectives: (1) Forestry for industrial growth; (2) Forestry for livelihood and basic needs satisfaction (ZITZMANN 1999) or (3) Forestry for nature conservation. In the historical process forest management paradigms shifted between these three objectives and this is still so today. In a simplified form the view of tropical forestry can be reduced to six historical stages (STEINLIN & PRETZSCH 1984; PRETZSCH 1995):

(1) Traditional forest use

It is characterised by a great variety of benefits which the rural population gets from the forests. The forest products are mainly used for local consumption and often the access to the forest resources is regulated by informal rules. As part of these rules trees and forests can have religious and symbolic functions, as for example holy forests. Often the rural population has use rights towards land and vegetation. In their perception property rights often are in the hand of the ancestors and of future generations. Partly very well organised and intensive land use systems were elaborated, in which the natural tropical forest is simulated. One example are the forest gardens of the Maya population of Yucatán in México (NEUGEBAUER 1987). Today there is a strong discussion on the practical relevance and use of the traditional local knowledge for the development of sustainable forest man-

agement systems (PRETZSCH 1987; WARREN et al. 1995)

(2) Colonial forest use

Colonial influence led to the far reaching dissolution of the complex traditional forest use structure. Colonial forest policy was predominantly focused on the satisfaction of the need of the mother countries; world market oriented accumulation of raw materials from the forest and the creation of a land reserve for mainly export oriented rent cultures like coffee, cacao, oil palm and rubber. Complex and holistic forest use systems were substituted by a one-dimensional relation colony – motherland with a reduced view of human benefits from the forest and with reduced use rights of the local population. Private property land titles were introduced. This created a two class society: people with and without land title (PRETZSCH 1987). Traditional rules were substituted by the *paradigm of modern European forestry*, which was based on the maximisation of sustainable timber production (ROBINSON 1998). Beside this the dominant organisation structure was the state forest administration with its typical prussian top down approach. It represented more a police and control attitude than support of the local forest farmers and co-operation. Forest destruction was still relatively limited, but the structural changes in many societies led to a lack of interest of the rural population in forest conservation.

(3) Forest use as an accelerator of economic growth

After de-colonisation in many tropical countries the European paradigm of forest management practice was kept. In some countries, like India, even more power was given to the state administration. The idea, that tropical forest resources have to be seen as a capital stock which could be liquidated rapidly was born in industrial countries. It was argued that economic development requires mainly capital to proceed from the stage of the *traditional society* to the *take off* (ROSTOW 1960). Under the conditions of initial growth and transition towards industrialisation the system of sustainability was seen as not applicable for tropical forest management (ZIVNUSKA 1966). Only massive forest use, respective capital investment in timber industries and later

reinvestment in plantations would permit a rapid growth of the national economy (*big push*). Many countries followed this way and mainly failed because of corruption, the lack of adequate organisational structures and political will (examples are Philippines, West Africa see PRETZSCH 1986, 1987). Most of the capital was either transferred to industrial countries or consumed by the national elite.

(4) Internationalisation of forest policy

Also the flow of production factors and products shifted from bilateral exchange (like in colonial times) to more and more internationalisation. With the occurrence of multinational enterprises the timber sector became devious. Influence of international organisations like the FAO and the World Bank on the forest sector increased. Both actors, international organisations and big enterprises followed one common paradigm: tropical forest management as well as plantation development require mainly technological knowledge and are feasible in the framework of good planning. A certain euphoria towards large scale state planning could be observed. This led to a more and more marginal position of local forest people. On the other hand importance of environmental aspects in the political agenda and respective sensitization increased from the Stockholm Conference (1972) onwards, giving more and more space to the problems of tropical deforestation.

(5) Polarisation of forest policy

The dominating paradigm of large scale planning and the preference for industrial forestry did not lead to the expected results. The western concept of scientific forest management for timber production proved to be not always applicable in tropical countries. International organisations faced more and more criticism and they were forced to modify their forest development strategy stressing more social and environmental objectives. The TFAP initiative which was initiated by FAO together with the World Bank and World Resources Institute failed because of the lack of participation of relevant groups of society, top down planning mechanism and mono-sector-approach. Besides industrial forestry, community forestry and social forestry were increasingly propagated. Grass-root organisations and Non

Governmental Organisations were often more active and efficient than state forest services and governmental projects.

(6) Actual era of globalisation and privatisation of forestry

The dissolution of the communist block led to a profound scepticism on public forestry. Also many community forestry programs had failed. So privatisation of forest land, often together with agricultural land, has become a major trend. So far it is hardly possible to foresee the consequences of this process. But it is obvious, that the continuous provision of non marketable forest services requires support from the state.

The overview shows the change of paradigms and the come back of old ideas with a new face. It also shows the dependence of forest management from the dominating social and economic dogma.

2. Forestry between state intervention and participation: where are we now ?

The formulation of an adequate forest policy and its implementation down to the grass-root level is getting a more and more complex issue. On one hand history shows us, that the time of state dominated forestry has passed at least in post industrial societies. In many developing countries the conflict between state domination and empowerment of local forest people is still under intensive dispute. It is not clear, who is responsible to moderate the process towards a new distribution of responsibilities and power in forest management decisions. Is it still the state, should there be more private engagement or should the floor be opened for more NGO engagement? How can global interests be taken in account?

Identifying this position, a clear orientation is missing in many countries as well as on a global level. The re-balancing of power relations often happens without any moderation and anticipation of possible outcomes. Such a process represents a high risk of weakening the position of forestry in the competition with other land uses.

Special characteristics of forestry make forest policy development complex and difficult in relation to other sectors. Beside the long term fixation of capital in the forest, low capital return, the character of trees as product and production factor it is mainly the character of forest as a common property. Some products and services are a direct benefit for the owner, others are produced in the forest, but are consumed by the societies as a whole or by some groups of human beings outside of the forest. In the reverse case the forest owner has to take in account negative impact of other sectors in form of social costs. This is for example the case when industrial pollution effects the forest stand or when the water regime is influenced by projects outside of the forest. Additional problems of accountability are related to different levels of demand of forest products and services. The main product oriented interests exist on the level of the local forest production, but these interests may come in conflict with higher level demand on a regional, national and international scale (BASS & THOMSON 1997). The ordination of this different interest levels requires a clear concept and the interference from a super-ordinate level. The state has an important function to moderate this process.

In practice this means that many forest management decisions require a negotiation between private interest of the forest owner and public interest. This is especially the case if the consequences of the decision is deforestation or irreversible change of the forest cover, like in the case of plantation establishment. Three case studies are presented with the objective, to understand better reality and to think in a hypothetical way about possible strategies for the future.

3. Case studies

Case study 1: Resin tapping in Guatemala

The most common approach to bring together local interests of forest people with the state interest is the execution of projects on a limited local level. The objective is to induce a planned change on community or farm level. In a process

analysis on three social forestry projects in Guatemala, Honduras and Mexico the project implementation process and project impacts were analysed (PRETZSCH et al. 1993). In Guatemala the studies cover the communities of El Chol and Cubulco, which are placed in the mountain area with natural pine vegetation (*Pinus oocarpa*). In El Chol pine tapping is done since 40 years in small private estates. Work productivity of this activity is very low, an additionally limiting factor is the low product price, also due to the high absorption by intermediate traders. On the other hand legal restrictions together with bureaucratic barriers limit the use of timber and fuelwood on a legal base. By the creation of a farmer association the intermediate traders could be eliminated from the product chain and benefits for the community increased considerably.

But the discussion and the decision on the statute of the association was very unsatisfactory: after long time of military dictatorship in Guatemala the members refused to accept obligations. Everybody could join or leave the association without sanctions and there was no necessity to market the product by the association. So the institutional framework was reached by a participatory approach, but it was too weak to resist influences from outside. When a calamity occurred the harvesting of the affected trees for timber production had to be accepted by the Forest Department immediately. People shifted from resin tapping to fuelwood making because of a slightly higher work productivity and the less harder work load. Because of the lack of state control also non affected trees were cut. There was no more time for resin tapping and agreements with the industry on the provision of a minimum quantity could no longer be satisfied. As a consequence the offered price as well as the produced quantity decreased considerably. At the same time the intermediate traders entered the market again, offering higher prices for the product. Some members of the association shifted to them again without any sanction from the side of the association. The economic situation of the resin tapper association worsened rapidly.

The case study shows, that a planned change of forest management on a local level requires political will of the

administration, conviction of the local people that they really will benefit from a change and favourable framework conditions. If there is not a clear motivation for change and the respective space to realise it, the process will hardly be sustainable.

Case study 2: Natural forest management by the ejidos in Mexico

Study area is the state of Quintana Roo in the south of Mexico, were considerable areas of tropical rainforest are still existing. In the agrarian reform local Indian people as well as migrants from the north received homestead and limited agricultural land for private use and forest for their common use. As organisational units *ejidos* were established. But for long time the people did not receive benefits from the forest, it was exploited by a company of the Federal State Government in a very exploitative way and the money partly disappeared in corrupt channels. It was necessary to take fundamental counter measures. At the same time a group of land use experts was formed, who got their experience in different project situations in the south of Mexico. Important was, that they analysed various land-use options profoundly, took measures to improve and abandoned the place when the external intervention proved to be fruitless. Every step was very well documented. This group was present and interfered when the peasants complained in the above mentioned case that the state forest department was exploiting their forest in an illegal way and they wanted to take the management in their hands. The governor of Quintana Roo was in favour of the peasant, as all the money left the state towards the Federal District. The peasants formed their own communal forest service and put the state forest department out of work. At the same time the peasant association took over all the production factors as chainsaws, transport facilities and sawmills. Inventory were carried out by the forest people and the benefits from forest extraction were distributed by salaries and distribution of profits to all the members of the association. (PRETZSCH & JANKA 1991)

It can be learned, that community

stability depends mainly on economic benefits which are disposable for the community members. For the achievement of this type of stability development options are necessary together with the co-operation from a super-ordinate level. This level was represented by the external research group with its long experience, good contacts and the support from the state governor. On the long run the development will be not sustainable, as the community can only live overusing the forest. To equilibrate the situation external compensation for non-market benefits from the forest are necessary. (HESS 1996)

Case study 3: Paradigmatic shifts of forest policy in India and Thailand

Forestry in India was for long time subjected to the originally from Germany imported thinking of state dominated scientific forestry and the respective forest police apparatus. On one hand the Indian Forest Service is trying to conserve its power and the related beneficence as long as possible. In colonial times, with the repressive forest legislation the rights of the forest dwellers were cut drastically. Now step by step they are able to re-establish their traditional position. It becomes more and more obvious that forest resources contribute considerably to the satisfaction of the basic needs of the rural population. Beside this it is argued, that the rural people might manage the forest in a more environmentally acceptable way than the forest department. In relation to this the old pre-colonial management systems are mentioned, which were underlined by traditional institutional rules. These are seen as a viable alternative to state dominated forestry. The necessary dispute hardly is advancing. In some states the conflict becomes more and more violent (SHRIVASTAVA 1999). Forest department for long time was not willing to negotiate with these new partners. In India common management approaches like *Joint Forest Management* were only practised with much scepticism and unequal distribution of the benefit in favour of the Forest Department. At the same time the state forest area decreased rapidly. In this situation the peasant movement and other allied groups in the NGO sec-

tor rapidly gained power (ROBINSON 1998). It can be resumed that in India the drastic police behaviour and the missing flexibility of the Forest Department led to the birth of many grass-root initiatives which opposed the state forest policy.

In Thailand it was especially the expropriation of community land with the objective to establish forest plantations which led to the protest of the local farmers and to the loss of credibility of the Royal Forest Department (PYE 1999). It was especially the aggressive action of the Royal Forest Department which caused the rapid group formation and agitation as a strategic group of the affected peasants, together with allied actors. In both cases the state was not able to enter actively in a dispute with the newly arising actors and to look for a common solution.

4. Results and outlook

The case studies are based on the following hypothetical assumptions, which have to be analysed more profoundly:

- (1) The European tradition of scientific sustainable forest management, which originally came from Germany, can not be seen as a fix paradigm for the implementation of forest management systems all over the world. Flexibility of adaptation was missing in many countries. Often holistic traditional management concepts were substituted by a purely technocrat and one dimensional thinking. By this way much important local knowledge was lost.
- (2) Forest management strategies have to fit in the actual development process of a country, which is related to policy issues. The implementation of forest management strategies depends much on short term political opportunities. The link between forest strategies and general development policy has to be analysed much more profoundly before acting.
- (3) Simple forest management projects based on direct intervention and direct environmental education measures have only very limited success in the development towards

a sustainable forest management. The situation between forest and society is much more complex and requires a horizontally and vertically integrated intervention approach. Super-ordinate levels have to be included in the planning and implementation process and new planning methodologies have to be developed and applied.

- (4) Very important are changes of structural conditions and interventions in forest related sectors, which determine the relation between human being and forest. Forest Departments have to learn to act in a flexible way, to use options for change and to shift from their role as *police* and *manager of own state property* towards a role of an *initiator of a dispute* in the conflict oriented restructuring processes and *adviser* as well as *extensionist* in the case of big and small scale private forestry.
- (5) To make a planned change operational the co-operation of the State Forest Departments is necessary and learning approaches for forest administration urgently have to be developed and experienced in practice. Part of these approaches must be a continuous monitoring of all activities and their effects.
- (6) Much more dispute and exchange is necessary on the above mentioned subjects and especially on cultural differences in the perception of forest, differences in value systems as well as differing forest management paradigms on a global scale. One example for this type of action is realised in the Master Course *Tropical Forest and Management*, which is offered in Tharandt/TU Dresden. It is a forum for exchange of ideas and learning from the experiences of participants, coming from many tropical and European countries.

It can also be learned from the case studies, that – especially in forestry – planned change is much more complex than it is treated in most forest development projects. The studies on the conditions of paradigmatic changes show this. In this field much more investigation is necessary. Using the classification of HABERMAS (1965) it can be

resumed, that so far forestry focused much on the use of *analytic science and knowledge*. This mainly serves for the technical control of the environment. Forest related *humanistic science and knowledge* is still underrepresented. A shift away from technology orientation towards more dispute and integration of all local stakeholder needs is urgently necessary (VAN GELDER & O'KEEFE 1995). Well understanding paradigmatic changes opens the door for action. Foresters and forest scientists should use *critical science and knowledge* to promote possible alternatives of social organisation, benefit distribution as well as more equal distribution of production factors, which are in their negative shaping some main causes of forest destruction. (PRETZSCH 1998)

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Promotional Forest Complexes in Poland Create a New Image of Polish Foresters

Eugeniusz Pudlis

Abstract

Poland is the only European country which has, like Canada, through so called "model forests". In Poland these part of forests, being under special management, has been called: Promotional Forest Complexes (PFC). PFC were established in 1994. At the moment in Poland exists 10 PFCs, which cover nearly 446 000 ha – 6,1% of total forests, managed by the State Forests.

A Promotional Forest Complex is a larger, preferably heavily-wooded area within one or more Forest Districts, which has been established for promotion of the pro-ecological forest policy of the State. The process of identifying areas and boundaries of Promotional Complexes seeks to ensure the representation of different nature-forest regions and associated variability in habitat conditions, stand species composition, valuable natural features, productive possibilities and leading functions, as well as the diversity of threats faced nation-wide.

One of the core ideas of the state's pro-ecological forest policy is that the subject of forest management should not just be the stand, but the whole forest ecosystem. However, the overriding objective of the policy is to assure the permanence of forests and their multifunctional role. This puts forest adminis-

trators under the following (among others) obligations:

- to adjust the species composition of stands to existing habitat conditions
- to adjust harvest of timber to cultivation and protective needs
- to preserve forest marshes, peat-bogs, heaths, etc.
- to leave old trees with holes and a certain number of dead trees
- to employ safe technologies in forestry work and of selective agents to prevent or limit mass outbreaks of harmful organisms.

The detailed goals of establishing PFC's relate to the following issues:

- the permanent preservation or reconstruction of valuable features
- promotion of multifunctional and sustainable forest management
- research allowing conclusions to be popularised throughout the State Forests
- the organisation of training courses for the Forest Service as well as ecological education for the whole of society.

For the last goal mentioned above, in PFC has been created educational trails, forest chambers and Education Centres. Each Promotional Complex has its own Social and Scientific Council, which plays an opinion-creating and consultative role.

The Council consists of representatives of the local authorities, businessmen, scientists, journalists, NGOs, teachers, (sometimes even priests) and foresters obviously. The Council participates in some decision making for managing neighbourhood state owned forests. Members of the Council propose to set up new educational trails, tourists routes, paths for cycling and parking places, recreation places and information points as well. Sometimes, the Council of PFC helps to solve local conflicts, between inhabitants and foresters for example.

The existence of Promotional Forest Complexes brings nearer local society to foresters and vice versa. Journalists begin to prepare much more articles, radio and TV Programmes concerning forest, forestry and foresters. Extreme wings of NGO representatives, which are co-operating with PFC have stopped to spread the opinion, that foresters exist only for cutting trees.

In general Polish society, enriching its knowledge thanks to PFC activities, has changed its opinion on forests and foresters. People have started to believe that the only forest function is not to produce timber and foresters are not only woodcutters. The know now that they are real cultivators, wood's growers. The process of changing the image of Polish foresters is going to be continued.

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Creating a Framework for Public Involvement in Russian Forest Management

Victor K. Teplyakov

Overview

The countries of the former Soviet Union along with some former Eastern block countries are currently struggling with a transition away from top-down, technocratic management styles to a more pluralistic model of policy development and implementation. The difficulties are particularly acute in Russia where there is little tradition of involving the population in decision-making processes on natural resources management and conservation. A new legal and administrative framework needs to be established to create opportunities for public consultation. None of the Russian agencies dealing with natural resource management and conservation have a department for public relations or expertise in multi-stakeholder consultation processes. This gap often creates difficulties in communications and results in weaker or ineffective decisions on natural resource management, use and conservation.

There is growing experience from around the world demonstrating that local stakeholder involvement in formulating and implementing forest policy and management decisions leads to more environmentally and socially sustainable outcomes. The public at large must live with, and either benefit from or suffer from, natural resource management decisions. Without public support, which can be gained through public consultation and consensus building processes, natural resource management will not be effective. This is especially true in the forest sector of Russia's economy.

Under the technocratic management model of the Soviet period, the public did not have opportunities to participate in discussions and decision-making on the majority of natural resource management questions. Public involvement was also hampered by the fact that informa-

tion on natural resources was not disclosed publicly. However, with Perestroika and "glasnost" in the mid-1980s, public access to information increased, and materials on the USSR forest fund were opened to the public for the first time in 1988. Nevertheless, even today, there is often a lack of full public disclosure of information and lack of transparency in decision-making at the local and regional levels.

The Constitution of the Russian Federation guarantees rights on public access to information and there is a law on information disclosure. However, there is practically no normative basis or administrative experience for public involvement in forest management decision-making. Russia therefore needs to develop administrative mechanisms and methods for public participation in decision-making and implementation of natural resource management. Management agencies and the public need guidelines that will provide a framework, clearly identifying steps in a consultation and decision-making process. Such a framework will help managers to understand public concerns and their multiple perspectives on forest use, and will help the public gain a better understanding of natural resource management issues and decisions.

The need for partnerships between state agencies and public organisations and the need to find a better balance of the ecological, social and economic aspects of sustainable forest management were identified by Russian stakeholders as key priorities at the IUCN-sponsored workshop "Challenges Facing Euro-Ural Forests and Strategies for their Solutions", held in October 1998 in Moscow. This proposal for increasing public involvement in forest management is based on the strategies developed by the Russian stakeholders at that workshop, and implementation of the project will rely heavily on the partnerships with

Russian state agencies and NGOs formed during the series of IUCN-sponsored stakeholder workshops across Russia.

IUCN – The World Conservation Union and its activity on community involvement in forest management

Founded in 1948 IUCN – The World Conservation Union is the world's largest conservation-related organisation, bringing together 76 states, 111 government agencies, 731 NGOs, 37 affiliates, and some 12,000 scientists and experts from 139 countries in a unique partnership

IUCN – The World Conservation Union *mission* is to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

The IUCN Working Group on Community Involvement in Forest Management (WG-CIFM) brings together a wide range of stakeholders, including government and non-government community forestry practitioners, policy makers, donors, NGOs, activists and representatives from international organizations. WG-CIFM aims to:

- Distill the lessons learned from experience with community involvement in forest management worldwide, and
- Influence government and donor policies and practice to become more responsive to community initiatives to conserve forest ecosystems and use them sustainably.

WG-CIFM is producing a series of regional profiles documenting the efforts of communities worldwide who are reclaiming their rights to use and manage forests. Analysis at a regional level allows for a focused comparison of national policies in similar socio-economic and biophysical contexts and helps to stimulate discussion of how community involvement is enabled or constrained by national policy frameworks. Regions of interest are United States and Canada, Mesoamerica (Central America and Mexico), Southeast and South Asia, Southern and East Africa and Europe.

In 1999 the IUCN project “Creating a Framework for Public Involvement in Russian Forest Management” was launched in Russia with a financial support of the Dutch Government.

Why Russia and what is on in Russia?

The countries of the former Soviet Union along with some former Eastern block countries are currently struggling with a transition away from top-down, technocratic management styles to a more pluralistic model of policy development and implementation.

The difficulties are particularly acute in Russia. Among them are:

- Little tradition of involving the population in decision making process on natural resources management and conservation
- Absence of legal and administrative framework established for public consultation
- Almost no agency has a department for public relations or expertise in multi-stakeholder consultation processes in nature conservation and management
- No opportunities for the public to participate in discussions and decision making on the majority of natural resource management issues
- Public involvement is hampered by the fact that information on natural resources was not disclosed publicly

The objectives of the IUCN project in Russia are to influence environmental policy makers in Russia 1) by preparation of guidelines and recommendations on legislation and regulations of public involvement in decision making processes in forest management and conservation, 2) by building a coalition of stakeholders empowered to implement those guidelines and recommendations, and 3) by facilitating the Aarhus Convention on the Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998).

Most relevant projects’ outputs include the following:

- Recommendations for policy and legislative reforms to establish the

legal and administrative frameworks for public involvement in forest management

- Best practice guidelines for public consultation processes (Recommendations on interaction of foresters with mass media and public; Guidelines for public participation in forest management decision-making)
- Increased awareness of the importance of and benefits of increased public involvement
- Mobilised coalition of diverse stakeholders with the capacity to implement the recommendations and guidelines

There are many other legal acts but none of them dedicated directly to public involvement in resource management. To some extent public involvement in management and access to information is regulated by The Constitution of the Russian Federation (1993), Federal Law of the Russian Federation “On the information, informatization and protection of the information” (1995) and some other legal acts. The model law “On access to the ecological information”, which is very close conceptually to the Aarhus Convention (1998) that Russia has not joined yet, was accepted on 10th plenary session of the Assembly of the states – participants of CIS on 6th of December 1997. But there is no visible movement to implement this Law in Russia.

Some passages on public involvement exist in forest legislation. For example, Forest Code of the Russian Federation (1997) includes Article 96 “Participation of Public Associations in Fire Protection of the Forest Fund and of Forests Not Included in the Forest Fund”¹:

“In order to protect the Forest Fund and forests that are not part of the Forest Fund from fires, to prevent fires and suppress them, voluntary fire-fighting teams may be created. The order of creating voluntary fire-fighting teams is established by the laws of the Russian Federation.

The order of financing and for material and technical support of voluntary fire-fighting teams shall be determined by the government

bodies of the Subjects of the Russian Federation.”

Some other articles include indirect public involvement. But what it is in Forest Code seems very poor and does not give real rights to influence management practice.

Concerning information needs, Article 75. “Information on the Forest Fund” includes the following:

“Information on the Forest Fund shall include data from the State account of the Forest Fund, data derived from the State forest cadastre, forest monitoring, forest inventory and planning, as well as other data obtained by the Federal body of forest administration or its subsidiary organizations in carrying out their functions.

Information on the Forest Fund obtained using Federal budget funds shall be Federal property and shall be made available to citizens and juridical persons in accordance with the order established by the Government of the Russian Federation.” Such governmental act of the Russian Federation “Statement on providing the citizens and legal entities with the information about forest fund being federal property” (29 Sept. 1997) and appropriate order of the Federal Forest Service (20 Oct. 1997) were adopted.

Other significant forest legislative documents contain wide description on public awareness and public involvement in forest management. These are “Concept on Sustainable Forest Management in the Russian Federation” (1998) and “Criteria and Indicators of Sustainable Forest Management in the Russian Federation” (1998).

In Russian forest legislation only the Forest Code of Khabarovsk kray (a subject of the Russian Federation in Russian Far East) includes chapters on public involvement and ecological expertise.

Nevertheless many problems are still exist:

- Practically no legislative basis or administrative experience for public

¹ All forests except for those located on defense lands and the lands of settlements, as well as lands of the Forest Fund not covered with forest vegetation (forest lands and non-forest lands), make up the Forest Fund (article 7).

involvement in forest management decision making

- Urgent need to develop administrative mechanisms and methods for public participation in decision making and implementation of natural resource management
- Vital necessity to develop guidelines that will provide a framework, clearly identifying steps in a consultation and decision-making process.

Urgent need to join Aarhus Convention was raised by Russian NGOs at State Duma (1998-1999), at the Second All-Russian Nature Conservation Congress (1999), in mass media.

Within IUCN project in Russia seminars and round-tables on public involvement were held in some places, draft guidelines prepared, and working contacts with interested stakeholders and the Federal Forest Service of Russia established. On the first of June 1999 the project was presented at the Public Hearings on Environment Legislation at the State Duma of the Russian Federation.

In what we believe: our future steps?

Ongoing and future activities under the project could help to improve the

situation. One of most significant issue is development of draft Program on "Working together" to raise public awareness on forest issues prepared with the Federal Forest Service of Russia. Based on the small-scale sociological survey the development of training courses for foresters, college and university student's courses on "How to work with public and mass media" was recognized as of urgent concern.

IUCN Office for CIS believes that:

- Public involvement in forest management should foster wise forest use and forest conservation in Russia
- Creating a framework for public involvement in Russian forest management should give an opportunity to bring appropriate and necessary changes to forest legislation, regulations, and institutions as well as to social, economical and environmental forest benefits for people
- Better understanding of existing gaps and underlining the usefulness of working together could help to design education and communication programs both for foresters and people
- Seminars, briefings, lobbying, publications, training courses, video clips and other ways of communication and sharing the ideas are integral part of

consensus (partnership) building and securing public participation in forest management activities in Russia

- In recognizing the important contribution of this issue on forests, the cooperation with federal agencies and NGOs should support the efforts of the Russian movement towards democracy to enforce the government of the Russian Federation to join Aarhus Convention (1998).

Such a framework will help managers to understand public concerns and their multiple perspectives on forest use, and will help the public gain a better understanding of natural resource management issues and decisions.

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Additional Contributions

Amazonia under Threat

Rosa Amelia Fierro*

The Peruvian forest is the setting for a number of several different battles which have the same common denominator: poverty. The first battle was fought at the beginning of the century, with the frenzied felling of trees for their precious timber. At the time, the forest was thought to be inexhaustible. The subsequent battle began in the 1950s and was sparked by increasing internal migration. Large numbers of poor peasants abandoned their infertile Andean fields and found the promised land in the forest, where they established agricultural and livestock farms.

The 1970s saw perhaps the most deadly of the battles so far fought in the forest, and which still rages: cocaine production. Drugs traffickers discovered that, because of its climate, the high mountain forests were ideal for sowing massive amounts of coca, a plant which until then had grown like any other in the region. Immense expanses of forest gave way to coca plantations, and an increasing number of peasants chose to grow it instead of their traditional crops, which were less and less profitable.

The environmental damage caused by coca mono-culture was exacerbated by damage which, exponentially, is even more dangerous: the processing of coca to obtain cocaine. This activity is so harmful that large tracts of forest – including the water and the soil – have been contaminated for centuries to come. Because it is so far from so-called civilization, the forest has become the ideal place for laboratories involved in processing the basic cocaine paste. However, even the attempt to eliminate coca plantations and cocaine laboratories has brought about serious and irreparable

environmental damage. Dangerous herbicides are used, among other methods, to eliminate coca crops, but these substances kill not only the coca plants themselves but also any other plants around them.

During the 1980s, the forest played host to one of the latest battles. It became the refuge and operations center for subversive groups which allied themselves with the drugs traffickers, traded in arms, built landing strips and engaged in battle with the armed forces. The latter also built, and continue to build, counter-insurgency and anti-drugs operational bases.

Other activities also continue to affect the integrity of the forest. Oil companies set up camp wherever they find oil, even if it is in a protected area. Elsewhere, gold is mined under such conditions that destruction of the forest, as well as damage to the health of the men and children who work there under conditions of semi-slavery, are irreparable. What is society's view of these problems?

Firstly, there is more than one Peruvian society, and each one has a particular view of the forests. For the poor – almost a quarter of the population lives below the poverty line – the main problem is surviving from one day to the next and all they can rely on to do so is nature itself. How can we talk to these people about tomorrow if their future is now?

Despite the seriousness of the situation, some communities are beginning to understand that the action of destroying their resources amounts to suicide and, despite their limitations, they are willing

to make an effort to save their forests. However, the task is so enormous that it can only be successful if there is the political will and the financial and technical support to carry it through.

There is one sector of the population where there is some interest and understanding of the damage being done to the forests: it is the middle class, which consists of professionals, intellectuals and students. A number of initiatives have been taken at this level to prevent further damage being done to the forests and encourage conservation.

For those who flaunt their political and economic power, the forest is an inexhaustible resource to be exploited. For them, the forest is the loot which must provide the best possible return in the shortest possible time.

In the media, the forest has become synonymous with the word problem. Public opinion believes that anything which happens in the forest must be negative. And it is not entirely wrong. The forest is portrayed by the media as a scene of interminable social conflict, although the damage sustained by the forest always appears to be secondary to the human tragedy. For this reason, such events are often reported as crimes, with such frequency that most of the public is so used to hearing about them that they are seen as daily events. After all, for the inhabitants of a city as centralist as Lima, the Peruvian capital, the forest "is too far" for them to feel anything but astonishment.

Furthermore, in a country like Peru, which is three times the size of Germany, communication is so slow that talking about the forest is like talking about "another world". However, events have taken place lately which have caused the population to feel involved with the forest once again. Plants have been found with extraordinary curative

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properties and which, as could be expected, have been indiscriminately plundered once approved by Western medicine. This "boom" has been extremely deleterious for many Peruvians who have suddenly found themselves unable to pay the exorbitant prices charged for some of the ingredients of their traditional medicines. Many of these plants are endangered and are being collected in increasingly inaccessible places.

The image of the forest in the media swings between two extremes: the economic and the negative. Sometimes it is portrayed as the great wealth of the nation, the larder of a country which depends on food aid and imports. Many also paint an idyllic and mysterious picture of the forest, describing it as the ideal destination for tourists and adventure sports, as a place to be discovered, the nation's "future".

The opposite end of the scale is negative and pessimistic and depicts the forest as a dangerous and embattled place where the State has no power, abandoned and ungovernable, a "no-man's-land".

A third movement in the press – the weakest – is trying to put forward new ideas based on sustainable development. The forest is no longer an untouchable place that must be preserved at all costs, nor is it a larder that can continue to feed a centralist Lima, the economic elite, transnationals and drugs traffickers.

The media have actually played a part in a number of events aimed at saving the forests. In some cases they have worked with the population to achieve this objective. One of the most important initiatives was taken a few years ago, when settlers and various media joined together to defend the Pacaya-Samiria National Reserve, where a transnational company wanted to extract oil. Another noteworthy case took place in Cajamarca, in northern Peru, where various members of a peasant community were imprisoned on terrorism charges when all they wanted to do was defend their forests from being felled. A section of the media campaigned for the peasants, who were finally freed under the pressure of public opinion.

These and other experiences have shown the people that the media can be their first and sometimes only ally in the struggle to defend their environment. It is not unusual now for a community to organize and present its complaints to the media first, rather than to the relevant authorities. They have understood the importance of "going public". However, these experiences are still exceptions to the general rule of indolence. In fact, many of the campaigns launched to save the forests have not been taken up by the media so the majority of attacks on the forest remain shrouded in secrecy.

The Peruvian experience has shown that the press has been not only the pioneering medium but also the most consistent in campaigning for the forests to be saved. However, the great problem with the press is its cost. Newspapers are a luxury for most Peruvians and, in addition to this, Peruvian society as a whole reads very little. Given the economic and cultural situation, one could say that the radio is the ideal medium with which to run campaigns of this kind because it reaches the most isolated communities, and there are no households, however low their income may be, that don't own a radio. There are excellent examples of campaigns run on radio to save the forests. However, they have all been launched by local radio stations, none of them by the major radio stations based in Lima.

Television undoubtedly has greater impact on public opinion and on the higher echelons of government but campaigns run by this medium for forest conservation have been few and far between. There seems to be little room for this subject on Peruvian television today, which is full of programmes concerned with trivialities.

The media have had several very positive experiences in promoting public participation in the decision-making process on matters which relate to the forests. However, this trend has decreased in recent years. In the current economic situation, the media face serious limitations. The first one is financial. The economic crisis in the country can be felt in the media which, in order to survive, have to depend on one economic power group or another, which

restricts their independence. Because of this economic instability, much of the media is also unable to face up to political pressure, which has increased dramatically in Peru in recent years. It is no secret that Peru is facing a breakdown of democratic institutions and there are constant threats made against the freedom of the press. One of the instruments of government pressure is, for example, State propaganda, which does not reach the opposition media.

Another limitation relates to the media themselves. For many newspaper owners, editors and reporters, forest conservation and sustainable development are unimportant issues that "don't sell". If it doesn't appear in the crime pages, the forest can only be used as a filler, which explains why very few papers have sections dedicated specifically to the environment.

If at least one of these limitations can be overcome, the media in Peru will be in a better position to promote public participation in decision-making on forest-related issues. But the Peruvian media has a long way to go in this direction.

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The “Forest History Collections in Fürstenberg/Havel” Project – The Use of Historical/ Cultural Aspects to Develop Critical Ecological Awareness on the Subject of “Forests and Society”

Erich Hobusch

Abstract

The forest history collection can be traced back to a project from 1998 by the “Verein zur Förderung des Waldes und für Forstgeschichte e.V.”, a non-profit association for promotion of forests and forest history. The old hospital building in Fürstenberg/Havel, situated in the north east of the state Brandenburg, has been home to the forest history collection since 1998. The region’s economic future – as also defined by local inhabitants – is highly dependent on the continued organisation of tourist attraction since the dominant role of industry, agriculture and forestry has declined. Our abundance of forests is the only basis for the sustainable development of nature-friendly, ecological and socially harmonious tourism for the region.

With this in mind, we developed an exhibition conception which, alongside the conservation of forest history and ecological subject matter, above all views the collections as a whole as a so-called “green classroom”. In co-operation with experts from the fields of forestry and

technological history, as well as curators for the collection stock and with the active support of the Fürstenberg forestry office, we are looking for effective possibilities of presenting this subject matter in a way which appeals to the public and is at the time in line with the educational task of our institution. We see ourselves as part of social culture conservation and part of a social legacy committed to documenting the subject field “forestry and society” and presenting it regionally.

A range of subjects, from forest development and the hunting situation, nature and species protection in conflict with ecological use of and demands on forests, to property and ownership of the forests in a mutually influential relationship with economic use, forces us to form clear methodological approaches to aim-oriented collection and exhibition activity.

To this aim we have implemented three solution possibilities:

1. Thematic focal points for informative permanent exhibitions in which we own objects suitable for exhibi-

tion or are in a position to borrow them from other collections: e.g. tar furnaces and charcoal distilleries in the Menzer Heath.

2. Parallel to these exhibitions, we also display our stock in the viewing and study collection to interested public groups by means of thematic special guides.
3. Inclusion of the open-air exhibition ground and the immediate surroundings by means of special exhibitions and teaching trails, e.g. technical large objects from forestry daily life in different historical eras; we were for instance able to recover an approx. 180-year-old framesaw and to re-install it as functioning object in our open area; presentations of adapted work machines for additional forestry use etc.

Aim-oriented excursions and educational walks along special thematic paths to old glassworks, forester’s lodges and memorial stones also enable us to supervise and guide interested groups of visitors. Our aim is to be source of enrichment for visitors to the Fürstenberg forest history collection, and to provide a general and accessible understanding of the ecological and social contexts of “forest and forestry”. In turn, we want to use this information about forest history to be able to actively help to define the future of forest by means of “green paths” and “green classrooms”.

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The Image of the Forest in German Print-Media

A contribution to discussion

Jochen Knobloch

As a freelance journalist working for various magazines I complain about the tendentious negative reporting in German media.

The permanent implementation of the journalistic guideline 'Only bad news is good news' results in the predominance of information on forests on following occasions:

– Forest decline

This is a phenomenon which is apparently applicable to each dead tree and has entered foreign languages in the German original (in french "le waldsterben").

– Ecological disasters

When forest pests occur, storms rage in the mountain forests or an avalanche breaks its way, it is always reported as an ecological disaster instead as a natural event.

– Forest destruction

Predominantly identified as clear cutting by the insatiable paper industry.

As a rule, dissemination of knowledge is not practised. The forest serves, as do many other issues of nature, as proof for scientific questionable positions of representatives of various groups.

Much too often, photographers and journalists start out into the world (and into the forest) by order of the chief editor to illustrate his opinion. Since consumers most often do not have detailed knowledge on the subject, they are not able to classify the flood of negative reports and ruinous scenarios. According

to my experiences, this leads to two kinds of reactions:

1. Consumers do not trust any report at all, inclusive those which are objective and correct.
2. Consumers develop a cynical position, following the motto 'My car also runs without forests'.

My concept is: The protection of forests starts at the individual desk.

This means not only to use both sides of a sheet of paper, but also to accept following criteria when writing reports on forests:

- Dissemination of knowledge instead of demagogu
- Demonstration of the treasure we need to protect
- Motivation by showing examples of sustainable utilisation instead of pillorying forest destruction
- Reporting about the regenerative abilities of nature

I want to present here two publications and an exhibition as examples of my work as shown on some boards in this conference room.

ZEIT MAGAZIN (weekly newspaper): a report on the PUSZCZA Bialowieska

STERN (weekly magazine): The lungs of the earth, threatened natural forests in four continents (Seychelles, Canada – Vancouver Island, Poland – Puszcza Bialowieska, Costa Rica – Monte Verde National Park, New Zealand – Fiordland).

Currently, I am working on a project 'Germany natural forests'. Of course, the forests are not natural in a narrow sense, but near-to-nature forests with a potential to return to a natural state if left alone. Up to now I visited the forests shown here:

Vilm Island, Eastern Sea

No management during the last 400 years

Der Darss, Eastern Sea

Coastal forests in an area, which is constantly changing due to erosion and deposition, thus demonstrating the succession cycle from pioneers to beech-forests

Serrahn / Nature Protection Area Müritz, Mecklenburg-Vorpommern

Serves as example for undisturbed forest development in mid-Europe

Nature Protection Area Upper Harz Mountains

Spruce forest at the tree limit. In the course of evolution a new breed of spruce developed with extremely hanging branches that are better equipped to withstand snow masses

Taubergiessen

This alluvial forest along the Giessen is protected for decades now

National Park Bavarian Forest

Here in the remote areas near the frontiers true natural spruce forests are to be found

National Park Berchtesgaden

In the inaccessible parts of the Watzmannkars and near the Obersee some natural forests remained

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Stichting Robinia – Background and Goals

André Claassen

The Robinia Foundation is an independent Dutch organisation that was founded in September 1991 in Wageningen, The Netherlands. It is an information centre that works towards a better understanding and optimal utilisation of European quality wood species. Although many European species have a lot of potential they are often not recognised as an interesting commercial product. One of the most promising species is the *Robinia pseudoacacia* (more well known as robinia or black locust). Robinia and other interesting species are presented in a 'forest-to-wood' chain perspective so that the whole line from planting to product is explored.

Objective

The Robinia Foundation has one major goal: to encourage the use of

European quality wood in a positive manner that leaves the environment intact.

The strategies to achieve this are best described by the following:

- Improve the exchange of knowledge between and beyond the different sectors in 'the forest-to-wood' chain.
- Encourage the establishment and management of tree species which are known to produce quality wood.
- Optimise the link between demand and supply of wood as well as to optimise the utilisation of wood. Encourage to use of European quality wood in durable products.
- Supply information about the possibilities of applications of wood.
- Support initiatives and activities which contribute to the achievement of the aims of the Robinia Foundation.

What does the Stichting Robinia stand for:

- Knowledge and information exchange: research, reports, fact sheets, media.
- New and improved afforestation and management techniques: monitoring, field trials.
- 'Forest-to-wood chain' intersector dialogue: discussion groups, workshops, symposiums, fairs.
- Project partnership and assistance: international, profession oriented co-operation.

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