

FORESTRY IN THE CONTEXT OF RURAL DEVELOPMENT: FUTURE RESEARCH NEEDS

Edited by Peter Glück and Gerhard Weiss

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Division VI



European Forest Institute

**Forestry in the Context of Rural Development:
Future Research Needs**

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FOREWORD

COST is the French acronym for European Cooperation in the field of Scientific and Technical research which allows the coordination of national research at a European level. The COST framework consists of 25 European countries and the European Commission. The purpose is twofold: coordination of national research at a European level (concerted action) outside EU programmes following the bottom-up principle, and enhancement of cooperation among EU member states and other European countries. In 1994 the four-year COST Action E3 "Forestry in the Context of Rural Development" was launched involving 19 European countries and, therefore, signifying the European importance of this topic.

Rural development in Europe is characterised by new afforestation of vast areas of ex-agricultural lands due to the European Agricultural Policy and new uses of forests for conservation, recreation, landscape amenities, etc., in addition to timber production. Both developments require increased knowledge of the sociopolitical aspects as well as the technical/silvicultural aspects of farm forestry. Since people are nowhere else as dependent on forests as in mountainous areas, the policy means and silvicultural treatment of forests protecting those areas should also be studied. These objectives determine the tasks of the four working groups of the COST Action E3.

The international conference "Forestry in the Context of Rural Development: Future Research Needs", which was held from 15 to 17 April 1996 at the Austrian Academy of Sciences in Vienna, gathered most of the working group members of the COST Action E3 and other participants from 16 European countries and the USA to discuss the ongoing research of the four working groups in the light of guest papers. As the conference took place in the mid term of the project's life span, there was the chance to recall the overall common objective of forestry's contribution to rural development and define the research gaps for the remaining two years.

The conference was organised jointly by the European Union COST programme and the Institute of Forest Socioeconomics of the Universität für Bodenkultur Wien, and supported by IUFRO Division VI (Social, Economic, Information and Policy Sciences), and the European Forest Institute. In this respect, we would like to thank all participants for their contributions. Furthermore, we wish to express our gratitude to Mrs. Hermine Roth and her team for their valuable support in the organisation of the conference; Mr. Hubert Fladl, Dr. Peter Kar and Dr. Alfred Pitterle for the organisation of the three parallel field trips; and Dr. Michael Häupl, Mayor of Vienna, for the excellent hospitality. Last but not least, we thank Mrs. Renate Kersic who has taken care of the transformation of the manuscripts into the present form.

Wien and Joensuu, November 1996

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WELCOMING ADDRESS

Peter Glück

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Vienna, Austria

Dear Minister, ladies and gentlemen, dear colleagues and friends, it is my very great pleasure to welcome each and every one of you to this conference as part of our COST action E3 “Forestry in the context of rural development”. I am also pleased to welcome you in this impressive building which dates back to the time of the Austrian empress Maria Theresia. In comparison to our previous conferences held last year in Florence and Copenhagen, this time the business meetings will be enriched by an impressive panel of keynote speakers. Their topics refer to the four working groups and their inter-linkages. Owing to these speakers almost all COST collaborators have come to Vienna. In addition, the speakers have also attracted quite a number of other participants from forest administration, research institutions, and NGOs, etc. who are equally welcome from all parts of Europe. Their contributions to the discussions will also be highly appreciated.

As Professor Niels E. Koch, the leader of the ongoing COST action “Forestry in the context of rural development”, will elaborate in his welcoming address in more detail, we started our work in 1994, after the senior officials of the 25 COST member countries unanimously agreed that concerted actions into research on forestry in the context of rural development are badly needed. 19 European countries declared themselves prepared to cooperate on this COST action which reflects the topical importance of the research theme. According to the main interests of the cooperating countries, the four working groups are dealing with:

- public perception of and on the attitudes of farmers and forest owners on forestry,
- management and silvicultural options of farm forestry,
- evaluation of silvicultural and
- policy means for protecting mountainous rural areas.

Much work has been done during the last two years. Every working group carried out a survey of ongoing research in its field in Europe and published the results, identified common research priorities, described common research projects or even applied for such to the Agriculture and Fisheries research programme of the European Union. Our COST action will be going on for two more years, so this mid-term conference gives us

the chance to consider new aspects and modify our work. This is why we have high expectations of our keynote speakers and what they will tell us. As most of the speakers are not members of the working groups, we may expect new views and ideas. The role assigned to the speakers is to stimulate scientifically fruitful discussions during the next three days and afterwards.

The issue of forestry's contribution to peripheral rural areas is not yet high on the political agenda. For many decades we have been used to reading the annually published statistics on shrinking employment in forestry, the dwindling contribution of forestry to GDP, etc. while the growing population centres suffer from traffic congestion, lack of dwellings, pollution and other problems. As we neither want the depopulation of rural areas nor the agglomeration of cities, structural policies at both national and European levels have been applied to diminish the disparities of income and living quality between rural and urban areas. These efforts are benefiting from the growing environmental concern which make rural areas more attractive for recreation, retirement residences and business sectors, independent of transportation cost.

However, the new clients of rural areas often share different values than traditional foresters. They prefer biological diversity, nature conservation, landscape amenities, etc. Alongside these new demands, timber will not lose its importance, because it is abundant, renewable, versatile and recyclable. The conflicts many foresters are faced with today in making timber production comply with ecological demands may even increase if foresters should also meet new social demands on rural areas. On the other hand, the new social demands open a chance for developing markets for new forest products and services which again would create new jobs in rural areas. Anticipation of potential conflicts in rural developments, analysis of the driving forces and making of proposals on appropriate policy means are without doubt challenging tasks for researchers. But does the knowledge of probable developments already guarantee a change for the better? It does not at all!

At the best, researchers can deliver some information on what will happen in rural areas if forest owners and foresters behave in one way or another. But the action, which will be taken, depends on political decisions or lack thereof. As a professional observer of the forest policy scene for almost three decades, I would assume that the forest community will only re-act to these challenges. But in this historic phase of transition, a more pro-active behaviour would be desirable. Many expect clear signals on how forestry can contribute to rural development, consisting of general guidelines and future actions. As all European countries share these needs, the next Conference of the Ministers of Agriculture and Forestry on the Protection of Forests in Europe could set this topic on the agenda of forest policy in Europe.

Being full of hope that our conference can serve this aim, I leave the floor to Professor Niels Koch.

WELCOMING ADDRESS

Niels Elers Koch

Danish Forest and Landscape Research Institute
Hoersholm, Denmark

Sehr geehrter Herr Bundesminister für Land- und Forstwirtschaft, Wilhelm Molterer, ladies and gentlemen, dear colleagues. Welcome to this COST Conference: "Forestry in the Context of Rural Development: Future Research Needs" here in Vienna – the capital of Forest Research in the world.

The forest lands of the 25 COST member countries cover approximately 170 million hectares, or 36% of their land area. This represents nearly one third of a hectare of forest for every one of its 500 million citizens.

The forests of Europe contribute to the economic welfare of an estimated 10 million forest owners and over a million employed in the downstream wood processing industries, very often in small rural companies.

Today, the social values of the forests for recreation and tourism, landscape amenity, biological diversity, cultural heritage and environmental protection are of increased importance and often of bigger importance than the wood production function of the forests.

Therefore, forestry is important in the context of rural development.

The European Agricultural Policy – the CAP – implies extension of agricultural production and new uses of agricultural lands. In this context, forestry constitutes an important means of rural development either by afforestation of abandoned agricultural land or by employing existing forests for more than just timber production.

However, more information is needed to overcome the different constraints which exist in several European countries.

- More understanding is especially needed of the public perception and the attitudes of farmers and forest owners towards forestry as a means of rural development.
- More information is needed on management and silvicultural options of farm forestry in order to open up new possibilities of income and employment.
- More information is needed on silviculture and management means as well as on policy tools in order to ensure the role of forests in protecting mountainous rural areas.

These themes are the research topics of 4 working groups within the COST Action E3 "Forestry in the Context of Rural Development". About 70 researchers from 19 European countries are collaborating in this programme.

In figure 1 the participating countries are shown, and in figure 2, the structure of the COST Action E3 which runs from 1994 to 1998.

In the first 2 years all four Working Groups have managed to:

- Carry out a survey of ongoing research in Europe in the field of the Working Group and publish the results,
- identify common research priorities,
- describe common research projects.

This Conference – arranged by our host, professor Peter Glück – is placed mid-term in the duration of our COST Action. You will be presented outstanding keynote speakers from all over Europe and from the U.S. inspiring us to plan for the last two years of our Action.

I urge you to use this Conference, our speakers, your colleagues and the excursions to benefit yourself and your work for Forestry in the Context of Rural Development.



Figure 1. The 19 European countries participating in COST Action E3: "Forestry in the Context of Rural Development" (1994-1998).

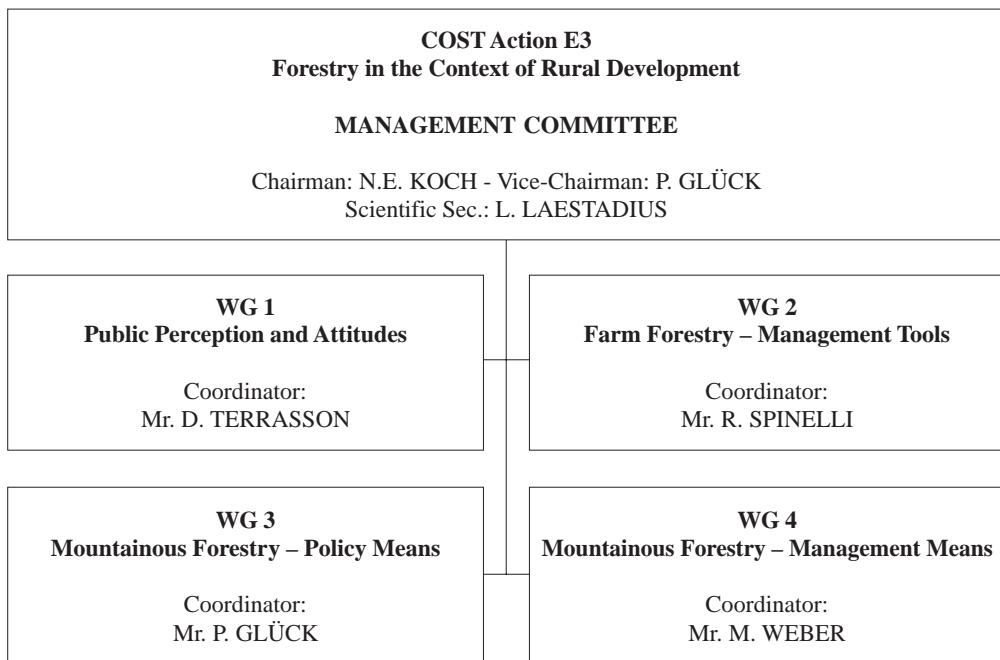


Figure 2. The management structure of COST Action E3 (1996).

OPENING ADDRESS

Wilhelm Molterer

Bundesminister für Land- und Forstwirtschaft
Vienna, Austria

Ladies and gentlemen, distinguished participants of this COST conference, as Austrian Federal Minister of Agriculture and Forestry, I would like first of all to welcome you to Vienna and wish you a pleasant stay in Austria.

As Austria is hosting this conference, let me first give you a short introduction to the state of forestry in Austria, the recent problems we are experiencing in our forestry sector, and some future aspects of development of forestry, especially in the context of rural agricultural development.

In Austria, forest affairs are within the competence of the federal government and are regulated by the Forest Act of 1975 and its 1987 amendment.

Forest land covers approximately 3,878000 hectares; this is more than 46% of the total land area of Austria and amounts to half a hectare per capita in relation to the (Austrian) population.

We classify our forests into commercial forests, protective forests in yield, and protective forests out of yield. Whereas 92000 hectares of the total forest area are maintained out of production, productive forests (commercial forests and protective forests in yield) represent 86% of the total wooded area.

According to the statistics of agriculture and forestry Austria has approximately 214000 forest holdings, 140000 of which are smaller than 5 hectares, 57000 forest holdings are in the category from 5 to 20 hectares, 12000 enterprises are in the category from 20 to 50 hectares, 4000 forest holdings are in the class from 50 to 200 hectares, and about 1000 enterprises are larger than 200 hectares.

The strategic targets of Austrian forestry are the maintenance and improvement of forests with the following partial objectives:

- Improvement of protective forests
- Reforestation of high altitude areas
- Forest management and tending of woods in a way that it is considered close-to-nature
- Safeguarding of genetic material of forest plant species and propagation of plant material suited to the particular site
- Appropriate forest area to fulfil all functions of the forest.

One important tool for decisions in forest policy matters and for the preservation of traditional land-use is the forest development plan which determines and evaluates all forest land according to the four leading functions: commercial function, protective function, welfare function and recreational function. Activities which are of primary public importance are listed as key functions. Due to the topography of Austria, the maintenance of the protective function is prioritised.

As a political representative of a mountain-dominated country, I have to call your attention to the special problems of protective and protection forests and their importance in mountainous rural areas. This is the reason why Austria is actively contributing to this COST project.

Mankind has made accessible expansive areas of the Alpine region for settlement and tourism; our national forest inventory shows a highly unsatisfactory condition of those stands which require special protection because of their ecological sensitiveness. This has been caused by a rapid change of environmental condition for the worse as well as by the increasing public demands put to forests. Within the terms of the so-called "Federal Restoration Planning of Protection Forests", precautions have been taken to protect forests from torrents and avalanches, to regenerate over-mature stands as well as to reduce injuring effects caused by the game population. Through the cooperation of forestry, alpine pasture management, tourism and hunting, a mutual consensus has to be found to guarantee regeneration, especially at the boundaries of these forest stands.

Ladies and gentlemen, I would like to conclude: the overall condition of our forests clearly shows that the international efforts to preserve forests need to be further intensified.

The contribution of forestry to rural development has to be seen from the viewpoint of general agriculture policy. Further international efforts, especially research efforts, must be undertaken to promote proper political decisions (Lisbon-Conference).

We must never forget that forests and their utilisation constitute the economic basis – and often the only means of survival – for many people. This also means that we have to develop such measures that are compatible with different forest ownership structures in different nations of Europe. As one step in this direction, I have the honour to declare this COST conference opened.



SESSION I

STIMULATING ONGOING COST RESEARCH

WHAT KIND OF RESEARCH IS NEEDED FOR RURAL DEVELOPMENT IN THE CONTEXT OF FORESTRY?

Birger Solberg

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ABSTRACT

This paper aims at describing what kind of research seems most needed regarding increasing the contribution of forestry to rural development. Socio-economic research is emphasised, since other papers at the conference deal more in detail with ecological and technical research in forestry. The necessity of having a good theoretical base is stressed – in particular related to (a) what is meant by rural development, (b) theories and hypotheses based on these theories regarding which main factors in general contribute to rural development, and (c) forestry's potential here. In this type of research one should also try to design experiments through comparative studies – within countries and between countries. As starting point of research in this field, it is important to clarify the following factors: the resource base (natural as well as human resources); the socio-economic and institutional/policy settings; the economic and resource links to other rural areas in the country, other regions, and internationally; and what knowledge can be drawn from previous development projects (success and failure stories) – why have some failed and some succeeded? Forestry and forest industries alone cannot provide rural development, but have to be seen in combination with the other sectors of the economy, not least of all the service sectors, and the investment opportunities available. Finally, the paper briefly describes a research project just started at the EFI regarding forestry and regional development.

1. INTRODUCTION

Employment and environment are among the two most important issues in today's Europe. Forestry is involved in both – particularly in the context of rural development.

The role of research for stimulating rural development is of considerable interest. How can research contribute? Are the benefits of these contributions higher than the research costs? What type of research is most appropriate? It is of course not possible

to answer these questions exactly, but it is necessary to address them and pass as consistent judgements of them as possible, as basis for a research strategy.

The main aim of this paper is to describe what kind of research seems most needed regarding increasing forestry's contribution to rural development. The needs will vary from region to region, based on existing knowledge, available resources and the perceived problems. Since other papers at the conference deal in more detail with research related to forestry's primary and secondary production (silviculture, harvesting, and utilisation, etc.), this paper focus on socio-economic research. At the end, a brief description is given of a newly established research project at the EFI which could also be of interest in the COST context.

2. RESEARCH NEEDS

Three main issues seem of particular importance when discussing what kind of research is most needed in the context of forestry and rural development: (a) Provide a sound theoretical basis; (b) provide increased empirical evidence; and (c) combine theory and empirics in an appropriate way. These issues are discussed in more detail below. It should be emphasised that there is clear overlapping between the topics mentioned, and they should be viewed as interlinked units.

2.1 Providing a theoretical basis

Probably most striking when going through some of the considerable amount of literature on forestry in the context of rural development, is the ignorance or lack of interest given to establish a theoretical base for the research. What is development? How can it be measured? How do we know whether development has taken place in the course of time? Is it possible to say that region A is more rurally developed than region B? In many studies, concepts like rural development, forestry, forest sector, sustainability, etc. are often not defined. Most often, there is no specification of theories or hypotheses about what factors bring about (sustainable) rural development. If theories are taken up, it is hard to find a proper stratification of the various theories and their basic assumptions, similarities and differences. Without theories, or with unclear theories, it is not possible to put forward meaningful hypotheses for empirical testing. Consequently, the research results are often "hanging in the air" – there are no hypotheses to be rejected. What seems to be needed, in particular, is a clarification of concepts, theories and hypotheses:

a) Clarification of concepts

Here one should bear in mind that a concept like "development" is not easy to define, and that it has a different content depending on which stakeholder is asked. The concept "rural development" is even more problematic. Development means improvement of some kind and is closely connected with increase in welfare. Whose welfare – i.e. the

distributional aspects – will then become important. Many of us would agree that improvement of the welfare of the poorest is more beneficial than improvement of the income of the richest, but how to weight welfare changes between different groups of people (or stakeholders) is not self-evident. In fact, it is mainly a political question. What research can (and should) do is to make the welfare implications as clear as possible for the various stakeholders involved in the development activities analysed. It is also important to make the concepts used operational. Income and employment (for various groups of people) are examples of this, but other welfare components, like social participation, a feeling that one “belongs” to the society, and self realisation are also important welfare components and should be included in the analyses, although they are more difficult to operationalize.

b) Clarification of theories and hypotheses for rural development

Rural development is closely linked to general national development. As such, theories of rural development are to a certain degree “specialisations” of general national development theories. The literature in this field is huge (cf. Tykkyläinen, Hyttinen and Mononen 1996, for a recent overview). However, very few systematic and comprehensive studies have been done regarding evaluating and comparing the various theories and their implications for rural development in general, and forestry’s contribution in particular. On the one hand it may look like a sack of theories based on very little empirical testing, and on the other hand there is a lot of empirical work related to rural development which has only rudimentary, if any at all, links to theory.

The differences between these theories are sometimes difficult to overlook – often it seems as though many of the same factors are involved, but the main differences are caused by the fact that they come from various disciplines: sociology, political science, geography, or economics. For example, the emphasis on knowledge-based economy in which the abilities to learn, change and adapt are the essential factors for long-term regional development, as described in Vartiainen (1995) as being one line in contemporary industrial geography, is in my opinion just one sub-factor in what economists would label “comparative advantages”. The same could be argued about the view of Malmborg et al. (1995), when they claim (cited from Vartiainen op.cit.):

1. Economic, entrepreneurial and technological activities tend to agglomerate at certain places, leading to patterns of national and regional specialisation.
2. The performance and development of a firm to a considerable extent seems to be determined by the conditions that prevail in its environment, and the conditions in the immediate proximity – in the local milieu – seem to be particularly important.

If the various theories were analysed thoroughly, one may, in my opinion, find rather strong similarities and complementarities between them, but with a different focus:

- Sociology-based theories emphasising the social network/interactions.
- Geography-based theories emphasising the spatial dimensions.
- Political science emphasising the power structure/relationships.
- Economic theories emphasising capital accumulations, markets transactions, technological change, and income distribution.

What is needed here, in my opinion, are good interdisciplinary analyses of the various theories with respect to main differences and similarities, and demonstration of what are testable hypotheses/implications of the various theories. The point here is not to find one unifying, common theory of rural development, but to clarify the real differences between competing theories – that is – to find the real set of competing theories.

Some of you may ask: Why bother with theories and hypotheses here? Why not go straight to the real world and the empirics, trying to do “something in reality”, instead of only making theories? My answer is that without theories one will have no possibilities of checking the impact of the research, nor the impact of any changes in rural policies proposed, etc. The empirical results depend upon a theory – to a large degree the research here will be to test competing theories. But to do that, the theories must be as clearly stated as possible.

It is self-evident that regional differences are important and must be taken into account. This does not, however, exclude a priori the possibility that some development factors are common in many settings.

2.2 Providing increased empirical evidence

This brings us immediately to empirical aspects. Three questions are rather basic here; (a) What do we know about forestry's actual contribution to rural development at present? (b) How much more can forestry contribute than it does today? (c) What are the institutional and policy changes (changes in forest policies as well as policies in other sectors – not least in agriculture) necessary in order to get these increased contributions from forestry, and what is the optimal level of contribution from forestry? I shall elaborate each of these points somewhat further.

a) Contribution at present

It is important to estimate the present contribution of forestry here. Exact estimates are seldom possible, but one should then aim at estimating the order of magnitudes of the various welfare components.

Saastamoinen (1996) and Solberg and Svendsrud (1995) are examples of such studies. Here one should try to give economic values of the various components, as politicians and other decision makers influencing the forest sector, whether they like it or not, have to base their decisions on economic “realities”. Uncertainties will prevail in such exercises, but it is also the task of research to estimate and present these uncertainties. For marketed goods and services, this task is rather easy, compared with non-marketed ones. But also here the increasing number of techniques developed and improved during the past 20-30 years (contingent valuation studies, hedonic pricing, etc.), gives interesting prospects, when used with care.

It is important that attempts are made to estimate the distributional impacts estimated. This demands studies of the attitudes of the various main stakeholders involved in forestry – from forest workers, forest owners, and forest industries to recreationists, ecologists and institutions advocating conservation and biodiversity protection. To my knowledge, very little has been done here. Such an overview is a necessary starting point for discussing changes which could bring more rural development from forestry.

An important issue here is what is the opinion of people living in the rural areas – what are their preferences? How many of the youth intend to stay in rural areas? What are their minimum requirements related to social contact, entertainment, institutional facilities? How do factors like income and employment opportunities for women, communication facilities, etc., influence preferences to stay?

This mapping of the distribution of costs and benefits implies that all existing forestry-based activities – including “ecotourism” or “green tourism”, etc. – are registered and valued. The baseline study should also include a description of the main socio-economic institutional and policy aspects which have made the present contribution from forestry possible.

In addition, one should try to map those forestry-based projects in the region which have been on trial, but have not succeeded, and why they have not succeed. This type of research will have to be based on interviews with the various agents involved in the projects and available documents.

b) What further contributions can forestry provide?

The first step here is to map the “possibility set” – How is it possible to do more, in addition to that at present? In this work, one could draw on experiences from other areas/regions, but probably the most important task will be to mobilise the available local/regional expertise. One has to combine the existing natural and human resources, institutional settings, capital and incentives, and develop products for which there is a sufficient demand. This is a difficult task, where entrepreneurship, involvement, support and willingness to take risks are involved in a complicated pattern. Rather little is known in general about such processes, and even less in forestry-related rural development projects. It is definitely an important research task to investigate such cases, and try to find to what degree some factors are more important components for success than others. Examples of questions to be investigated are:

- What are the types of new activities possible?
- What are their likely costs and benefits as well as distributional aspects?
- What are their direct and indirect employment effects?
- What are the main barriers, conflicts and risks? Which factors are most risky and what types of risk-sharing are possible?
- Which institutional, socio-economic, and policy aspects have to be changed to reduce the risks or to get the respective activities started?

If – like myself – one is of the opinion that income and employment are crucial factors in providing rural development, one main challenge in these areas is to find production of goods and services for which there is a sufficiently high demand. Here, I believe, research can contribute for example by providing comparative studies and overviews of experiences from other areas: What types of goods and services have been tested? What type of socio-economic conditions are most important for stimulating increased income and employment?

The power and decision-making structures in rural areas, and their connections to other domestic regions and internationally, are in many cases important, but have been very little researched to date.

In general, one should, in my opinion, give high priority to developing methods for comparing rural development processes and the conditions for the transfer of successful experiments between rural areas.

The influence of government involvement is a vital factor. What types of involvement are beneficial, and what are the opposite – in the short and longer term? Too few empirical studies have been done on this aspect. As pointed out by Merlo and Fodde (1995), based on Italian experiences, regional policies, particularly those based on subsidies and transfers, may be one of the causes impeding rural development in the longer term.

The policies in other sectors are related to this. For rural areas the policies related to agriculture, environment, regional development and transport are among the most important and have to be considered. Analysis of general social changes are of considerable interest here: changes in socio-professional composition, new interest groups, changes in attitudes and aspirations of rural populations and society in general, new links between towns and countryside, new functions for rural areas, development of power and decision-making structures in rural areas.

c) Institutional and policy changes necessary – and optimal contribution from forestry

Several of the activities proposed in section b) above will probably demand changes with respect to institutions and policies. It is important to include research on these aspects. Experience from similar projects and research in other areas and sectors should be utilised as much as possible. The above-mentioned type of analysis of unsuccessful projects could be of particular value here. The experience gained from various sectors and geographical areas should be systematised and made comparable.

The choice and development of appropriate technologies in forestry (both related to primary and secondary production) is of great importance – for example to make possible both sustainable timber harvest and eco-tourism.

The question of entrepreneurship is interesting regarding the creating of rural development. As pointed out by Mäkinen and Selby (1995), Drucker (1985) defines the entrepreneur as a person doing something different instead of simply doing something better than has already been done before. Where do we find such persons – what are their characteristics? Under which socio-economic and institutional settings do they flourish? Have we created social security systems and bureaucracies which discourage the risk-taking necessary for starting an enterprise? How can we encourage and motivate people who live in rural areas to find new sources of income? How much can be done through external activities – should the development be more internally driven? We know very little here – research is needed.

In general, the process of diversification of activities within forestry itself (e.g., choice of tree species, intensity between timber production and providing environmental services) and between forestry and other income-generating activities (like agriculture, tourism of various kinds, small-scale industries for niche-production, decentralised electronic-based information services and other remote forms of work) have been studied very narrowly. The same is true for the situation regarding analysis of the main factors (social, juridical, political, economic, and educational) of increasing the take-up of the opportunities for diversification.

The optimal contribution of new forest-based activities for a given rural area will have to be based on a consistent weighing of the factors described above. Each project should be viewed as an investment, but in a portfolio context of all other activities going on in the area.

2.3 Combining theory and empirics in research

Several aspects can be discussed here, but I shall concentrate on only a few. First, one should try to gain as much as possible from the information and knowledge already obtained in the context of regional development, in general, and forestry and rural development, in particular. This requires, as already mentioned, structuring the existing studies according to a topology which is detailed enough to give useful information. As far as I know, there are no studies of this kind in forestry at the moment.

Secondly, new studies must be properly planned. This means a.o. that rural development theory must be used as basis for the empirical studies regarding which factors to analyse and how to do this.

A third related aspect is that one should try, as well as possible, to establish an experimental research design, comparative studies where certain factors (e.g., forest resource availability, or certain institutional aspects) are the same, thus focusing on those factors which differ. Here, one should aim at several geographical areas in each country, and several countries involved. If enough study areas are found, one could get a much better basis than that at present for evaluating various theories on rural development and forestry's contribution to it.

In some circumstances it might also be advantageous to establish so-called "action-research" – i.e., research which includes actual implementation of activities for rural development, analysing the whole process and adjusting the course of the activities as new knowledge is obtained.

3. BRIEF ACCOUNT OF A NEWLY LAUNCHED PROJECT AT THE EFI

Last year the project "Forest Resources for Work Opportunities and Regional Development" (FORWARD) was launched at the EFI. The general aim of the project is to analyse the potentials and practices in utilising local forest resources for high value added production, especially in the border region of the EU. The specific objectives are:

- (i) To survey the current role of the forest sector – especially in terms of income and employment – in selected rural areas located mainly in the border regions of the EU.
- (ii) To analyse the reasons for the forest sector being successful in creating income and employment opportunities in certain regions and unsuccessful in other regions.
- (iii) To analyse how forest-related income and employment can be increased to contribute to the vitality of rural areas in Europe.

The project is partly financed by the Regional Council of North Karelia, Finland, and partly by the EU regional fund.

The project consists of three main components: The first is a detailed study of North Karelia. The second part is comparative studies between North Karelia and 5-7 selected regions outside Finland, preferably in the border region of the EU. The third part is to expand the second part (which is already financed) to include "sister projects" in other countries, preferably relevant projects which are already going on or about to be implemented. This third part will mainly be financed by the participating countries (domestic financing), but the EFI will cover some coordinating costs.

The project leader is Dr. Pentti Hyttinen. The project will last until 1999. More information about the project can be obtained from Dr. Hyttinen at the EFI. He is very interested in making contact with ongoing projects for collaboration – both for part 2 and part 3 of the project.

4. SOME FINAL REMARKS AND CONCLUSIONS

I have been rather general in this presentation focusing on socio-economic and policy/institutional aspects and not going into specific proposals for creating increased rural development. This is left to the other speakers at the conference. My main message has been that a better theoretical basis, coupled with relevant empirical studies, is necessary in order to establish fruitful research regarding forestry in this context. Comparative studies of several areas seem particularly promising. All interested are welcome to join the newly established EFI project to increase the possibilities for comparative studies and improving our knowledge in this important field.

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EVOLVING FORESTRY AND RURAL DEVELOPMENT BELIEF AT MIDPOINT AND CLOSE OF THE 20TH CENTURY

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ABSTRACT

Western world understanding, management and values of forest ecosystems, and their interactions with rural socioeconomic systems, are considerably different at the end of this century than at its midpoint. Our paper examines the nature, causes and impacts of this value and belief evolution in the United States, focused on rural community inter-relationships with public forests, agencies and managers.

At the end of this century, much traditional forestry thinking is evolving into more comprehensive, integrated forest ecosystem beliefs and management. For example, traditional sustained-yield models are expanding into sustainability concepts; emphasis on the economic growth of forest products sectors is evolving into broader, sustainable community socioeconomic development; and the management of community sociopolitical conflict over forest management is recognized as an equally important sustainability consideration as the management of biological components of forest ecosystems. These all contribute to making public forest management at the close of this century, and the needed research to assist it, much more: 1) broadly and ecosystem-based, 2) inclusive of diverse values or uses, and 3) interrelated with community socioeconomic or political systems.

Key words: forest or natural resource development; rural development; forest, natural resource or environmental values; forest and environmental policy.

1. INTRODUCTION

The industrial revolution and urbanization of the Western world was a major socioeconomic, political and environmental transition. European foresters were innovative and successful facilitators in these societal changes. They provided the United States (US) and the rest of the world much needed sustained-yield conservation values, beliefs and

management systems to supply dependable wood and other resources for growing urban industrial regions, to help reduce boom-bust rural economic cycles, and maintain long-term forest land productivity. Midway in the 20th century, US foresters were confident and rightfully proud of their profession's contribution to rural economies and ecosystems (Hays 1959, Kaufman 1960, Steen 1976).

Writing this paper at the close of the century, we are no longer so certain of how to define:

1. the structure and function of rural economic, social or environmental systems,
2. forest planning and management,
3. forestry's and forest managers' roles in rural economies, and
4. how they all interact and impact one another.

These beliefs are in transition, and rightfully so. For the Western world is trying to understand and adapt to its next major socioeconomic transition: becoming an urban, post-industrial, global economy and society (Toffler 1980, Drucker 1986, Reich 1991). Foresters are once again challenged to contribute insights, wisdom and conviction to help society and ecosystems successfully adapt to this major socioeconomic transition, as they did in the last one.

Our paper contrasts traditional versus emerging values and beliefs about forests, forest management and rural economic development – with some USA examples that, hopefully, have European relevance. We will examine the impacts of the current scientific and post-industrial revolutions on evolving:

1. basic forest ecosystem and management perceptions, and
2. general rural economic development beliefs, as they both are related to
3. the changing role of forests, forest management and forest managers (especially in the public sector) in sustainable forest management and rural socioeconomic development.

We will not attempt to identify a new forestry and rural community research agenda, but offer an expanding, more comprehensive ecological and socioeconomic environment that such an agenda will likely need to address in the 21st century.

2. EVOLVING VIEWS OF RURAL ECONOMIC DEVELOPMENT AT MIDPOINT AND CLOSE OF THE 20TH CENTURY

Kepler and Newton's scientific perceptions and predictive power of an ordered, segmented, mechanistic world helped formulate and fuel the industrial stage of Western-world socioeconomic development (Lederman 1993). In turn, the economic success of this revolution offered traditional sciences the luxury of fragmenting into increasingly separate, often impermeable disciplines and specialties. Economics and applied science professions in forest, wildlife, agriculture or watershed management patterned much of their perception, theories, norms or status systems on these traditional hard-science models and institutions. Today, just as in the traditional sciences, natural resource beliefs are in transition. The quantum physics paradigm shifts that revolutionized physics

and chemistry in the first half of the 20th century (Capra 1983, Lederman 1993) have spread to the biological sciences (Jantsch 1980), to economics and organizational fields (Senge 1990, Reich 1991, Wheatley 1992), and are now impacting applied natural resource and environmental sciences (e.g., Botkin 1990, CEQ 1995).

2.1 Traditional forest management thinking evolving to organic-model, ecosystem-based perspectives

It is not surprising that an industrializing European and USA society, and its public natural resource agencies, would embrace a "machine-model" world view. Machine-model (versus organic-model) thinking tends to view the world in rather simple, segmented, linear, cause-effect terms:

- | Machine-Model Perspective | Organic-Model Perspective |
|--|---|
| <ul style="list-style-type: none"> • Simple, independent-systems-oriented. • Reduce systems complexity by isolating and separating subsystems. • Linear, cause-effect systems organization and process perspective. • Deductive logic and simple efficiency optimization models appropriate. | <ul style="list-style-type: none"> • World composed of complex, diverse, self-organizing, integrated systems. • Understand integrated, interrelated systems organization and processes. • Multi-faceted, cumulative-effects, cyclical and synergistic system relationships are the norm – with chaos wildcard possibilities. • Inductive, integrative logic and complex, inclusive simulation models appropriate. |

The machine or clockwork model of economies or ecosystems, with their distinct and relatively stable structures, simple linkages and equilibrium tendencies, is being expanded, integrated and humbled by organic-model thinking in sustainable economic and in sustainable forest ecosystem management (UN 1987, Kennedy and Quigley 1993, CEQ 1995).

Linear, mechanistic thinking also characterizes the way many foresters and other natural resource managers were educated and role-modeled to become rational, respected adults and professionals. In our education (as with economists), we were usually taught to take control of a complex and messy world by dividing it into separate, manageable subsystems – over which we could model, manipulate and create real and illusionary mastery (Behan 1966). The diversity, complexity and interdependence of today's ecological, political and socioeconomic world requires more inclusive, comprehensive, organic-model thinking for economists and for natural resource (or environmental) professionals. This includes our forest ecosystem beliefs (Kessler et al. 1992, CEQ 1995), as well as beliefs about the structure, function, and urban interrelationships with rural economies, in which most forest ecosystems are located (Knight and Bates 1995).

2.2 Traditional rural economic values and views evolving into organic-model perspectives

Traditional views of rural economies in the 1950s had mechanistic simplicity in their structure, operation and urban interactions (Rasker 1994). Rural economies exported basic commodities to urban areas in exchange for goods and services. Upon these "basic" rural export industries depended households and less important, non-basic service sectors. In addition, rural economic goals were usually seen in relatively simple, linear terms (Hyman 1994): economic growth = economic development (e.g., more jobs, taxes and infrastructure) = progress (i.e., long-term, sustainable socioeconomic and political development). Community development was seen as primarily (or completely) economic development – not as a complex, socioeconomic development process. Simplicity and confidence prevailed.

Compared to urban areas, rural economies were perceived (accurately and inaccurately) as:

1. separate and distinct in space and time,
2. more simple, less diverse and less sophisticated, and
3. more unstable and less resilient – putting them at a comparative economic disadvantage that often justified government support.

Rural economies and social systems in the 1990s are much more diverse, complex, sophisticated and urban/globally interrelated. Many are often less disadvantaged or different than their urban counterparts (ERS 1995). Table 1 illustrates several of these important 1950-90 rural socioeconomic changes and evolution in beliefs. Only a few of the more important ones are addressed in detail here.

Consider the changes in the simple, distinct rural space and time dimensions in 1950 versus 1996 (Table 1) that require rural planning today to think regionally, not rurally (CED 1993). Population growth and transportation technology has shrunk the time and distance between rural and urban areas, as goods and people travel at 100 km/hr. As Freudenburg and Gramling (1994) observed, about 90% of US jobs in the 1800s required workers to be close to farms and raw material supplies; only about 5% do today. Recent changes in communication have been even more rapid and dramatic, with communication technology moving phone, FAX or computer information at light-speed – providing more rural independence and blurring many traditional rural-urban relative economic advantages or possible futures. In an information age and economy, much of this rural information export is of high economic value. It provides a regional economic base as real, important and promising for the next century as agricultural or forest product exports were in the 20th century.

The primary socioeconomic forces impacting agriculture, forestry and other commodity industries in rural economies are changing in evidence and theory. About 80% of USA land and 20% of the population was rural in 1993 (ERS 1993 and 1995, Bureau of Census 1992). The major concentration of this rural population is in the Southern states, where forest products sectors are still a major part of the rural economic base. Where about three-quarters of US rural counties had 20% or more of their earned income derived from agriculture and other commodity sectors (including forest products) in 1970, less than 25% do today; and more rural US counties are dominated by manu-

Table 1. Evolving views of USA rural economic system structure and function at midpoint and close of the 20th century

Mid-20th Century Views (1950)	Close of 20th Century (1990)
Rural and urban economies are distinct and separated by: 1) space – long distances, and 2) time – travel, communication or delivery times, which is a major "comparative economic disadvantage" compared to urban areas.	Rural-urban socioeconomic systems are less separate and distinct in: 1) space – as they physically grow together, and 2) time – as transportation, communication and other technologies link them both together, and with expanding world economies.
Economic linkage is a relatively simple, linear flow of rural commodities to urban areas, in exchange for urban goods and services.	Rural-urban linkages are expanding in number, changing in complexity and function, and involve much more than one-way rural commodity flows (ERS 1995).
Rural economies are usually commodity-dominated (i.e. forestry, agriculture or mining). Urban economies are manufacturing- and service-based.	Both rural and urban economies are becoming more diverse and mixed. Commodity sectors rarely dominate US rural economies and account for little recent economic growth.
Basic export sectors (usually commodities, with some manufacturing) are the foundation of rural economies. The service sector (e.g., lodging, retail or financial sectors) are secondary, non-exportive and mainly supportive.	Many rural service sectors today are growing in size, changing in composition and diversity. They are exporting services and are "basic" economic sectors in recreation and tourism, health services, construction, or retirement and transfer incomes.
Rural economies compare unfavorably to urban economies in size, growth, diversity, stability, resilience and technological sophistication.	Rural economies are becoming more diverse, stable and robust. Many emerging industries are mobile and rurally adaptable, by using computers, FAX-machines, communications or information systems (e.g. Internet).
Rural households and residents are easily identifiable and categorized, as compared to diverse, mobile urban populations.	With many temporary (vacation-home owners or seasonal workers) and new permanent residents (retirees, urban commuters, new entrepreneurs), rural-urban, resident-nonresident categories are difficult to establish and less useful in analysis.
Rural households and entrepreneurs tend to be more traditional, less mobile, less innovative and often in need of outside, public assistance in managing their businesses, communities and regional economies.	Expanded, improved education and world exposure of rural people, plus immigration and retirement populations, have lessened differences between rural-urban socioeconomic innovation and adaptation.
Rural development = economic development.	Rural development = social development, with important economic, political and environmental components.

Mid-20th Century Views (1950)	Close of 20th Century (1990)
Development in communities' focus: economic growth traditionally viewed as a beneficial end-in-itself (i.e., progress). It was seldom challenged or its community or ecosystem impacts scrutinized (CED 1989, CEQ 1995).	Long-term sustainable development of communities' focus: traditional rural growth/development assumptions and beliefs are being challenged and examined, and are viewed as a means to desirable and undesirable socioeconomic, community or environmental consequences.
Rural development benefits are easily measured as amount of economic or job growth. Sociocultural, political or environmental impacts rarely conceptualized, predicted or monitored.	Many +/-, direct/indirect and short-/ long-term socioeconomic impacts must be conceptualized, measured, linked and weighed to estimate net socioeconomic, political or environmental benefits.
Economic development usually viewed and modeled as short-term (1-3 years), linear, direct and indirect rural dollar and/or job impacts.	Many +/- impacts of rural economic development on regional economies, communities and environment take time and often occur in non-linear, cyclical or synergistic ways.
Rural economic planning and development often pursued by small communities or regions in win-lose competition with neighboring economies.	A new regionalism (CED 1995)is developing, where resources and talent are shared over larger, more diverse rural (and urban) areas to plan for, attract new, and enhance existing businesses to effectively integrate economic development into regional cultures and environment. Motto: think and plan regionally, benefit locally.

facturing than are urban ones. Between 1950-1990 the percentage of rural US workforce employed in agriculture, agriculture services, forestry and fisheries dropped from 15-8%. Manufacturing's share of the rural workforce dropped much less (20-17% from 1950-1990), and now employs twice the number of rural residents than traditional extractive industries (Bureau of Census 1992, ERS 1995).

Service sectors in most rural (and urban) areas provided the greatest economic income and job growth of the 1990s, employing half of rural employees. Some of these are low-pay, low-benefit and poor advancement jobs, that have earned service sector employment low status and a poor reputation. But the US service sector is changing and diversifying in a post-industrial economy, with many service jobs in desirable and competitive design, education, sales, health, finance or communication occupations. This is reflected in shrinking national wage differences between service and goods-production labor, with service wages only about 4% less today (Bureau of Census 1992, Rasher 1994).

Table 1 illustrates other important ways that rural US economies and societies are becoming more diverse, complex and dynamic at the close of the 20th century. As with evolving forest ecosystem views, more inclusive, interrelated and adaptable (organic) models and theories are required in the 1990s to understand, manage and research the

long term, sustainable relationships of rural ecosystems, economies and community sectors (CEQ 1995, President's Council on Sustainable Development 1996). Although traditional commodity activities are no longer as strong an economic support and rural growth sector, they can be just as critical to the long term sustainable future of regional rural economies as they have ever been. For without sustaining their forests, fields, waters or wildlife habitats (plus the other quality-of-life conditions of scenery, recreation, small community settings other cultures they helped to create), new rural economies could boom and bust just as some old resource exploitation economies once did. Physically decaying, economically depressed mining or logging "ghost towns" of the 1890s, could be developing in hasty, unplanned, super-subdivided, tourist boom-towns of the 1990s.

Rural forest and field landscapes are in that condition because they meet the needs of private (or public) landowners – be those needs income, pleasure, or citizen legal and budget support. For private US forest owners, their motivation is varied and seldom dominated by economic incentives (e.g., Bliss and Martin 1989, Moulton and Birch 1995), and often does not differ substantively from environmentally-oriented values of non-forest owning publics (Bliss et al. 1994). Businesses (e.g., recreation and tourism) and residents that benefit from these quality-of-life agricultural and forest landscape assets must find ways to ensure their sustainability. Public and private forest ecosystem managers should play an active partnership role in developing and enhancing such community cooperation.

3. EVOLVING VIEWS OF FORESTS AND FOREST MANAGEMENT IN RURAL ECONOMIC DEVELOPMENT

Figure 1 summarizes four eras of US public forestry, from the cut-and-move stage, to sustained yield, to multiple-use, to the current ecosystem-based management orientation that is further defined in Table 2. We first examine the effectiveness of sustained-yield theory and performance, the changing economic composition and diversity of forested rural US areas, then focus on evolving roles of public forests, agencies and managers.

3.1 Evolving from sustained-yield to sustainable, ecosystem-based forest management

The assumptions, expectations and performance of sustained-yield wood supplies on rural communities have been challenged for decades (e.g., Waggener 1977, Wear, Hyde and Daniels 1989). Theoretically, a sustained flow of wood can not maintain stable employment with the population growth characteristic of most rural areas, and with continuous 20th century efficiency in substituting energy and technology for labor. In addition, most rural communities traditionally seek economic growth, not stability (Schallau, Maki and Beuter 1969).

As in US agriculture, technological efficiency in forest products sectors in this century has averaged a 2-4% increase per year (Freudenburg 1992). For example, a recent

Table 2. Evolving views and roles of forest resources in rural economic development at midpoint and close of the 20th century – a public forest and agency focus.

Mid-20th Century Views (1950)	Close of 20th Century (1990)
Forest's Role and Impacts on Rural Economies and Communities	
Primary urban needs and markets are for dependable flows of rural food, fuel, fiber or water inputs (commodities).	Rural food-fuel-fiber commodities are increasingly required of expanding domestic and global markets.
Of secondary and minor importance are other forest multiple uses and environmental products/services of the rural hinterland – or the size, attractiveness and "quality of life" factors of rural cultures and communities (Hyman 1995).	Increasing need of rural areas: 1) to store and recycle urban solid, liquid, gaseous and nuclear wastes, 2) for multiple uses (e.g., recreation/tourism or water), and 3) for general environmental amenities and services of healthy, diverse, sustainable regional eco- and socioeconomic systems.
Urban Needs of Rural Forests and Economies	
Forestry is a basic economic sector, where wood harvest and forest products industries generate most of the important direct and indirect rural economic benefits – benefits adequately expressed by the economic system (in local currency and rounded to two decimal points).	Wood production is often an important part of forest ecosystem's socioeconomic benefits to rural (and urban) communities. There are also many environmental, recreation/tourism and other quality-of-life benefits – expressed in economic and/or in other sociopolitical systems.
Sustained yield flows of wood and other commodities will usually create stable, healthy rural employment and communities.	Given: 1) increasing rural populations and 2) rapid substitution of technology for forest products labor, an increasing (not stable) wood harvest is needed for stable employment.
Forest owners and managers have the will and ability to provide maximum sustainable wood flows. The major forest growth, yield and harvest constraints are economic and technological.	Many biological, economic and political factors greatly reduce the ability to provide for sustainable wood supplies – major constraints on public forests are increasingly political (Thomas 1995).
Wood production is the major social value of forest owners (especially private) to rural communities – and this social value is accurately expressed by the economic system (Kennedy and Koch 1991).	Social values of private and, especially, public forest ecosystems are increasingly diverse and multifaceted – they are often forcefully expressed by rural social and political, as well as economic, systems.
Recreationists and tourists come to experience rural beauty and enjoy its land, water and open space. The quality or sustainability of these rural recreational assets are not as threatened (as are agriculture, forest or water resources) by unplanned, short term use/development.	Recreationists or part- to full-time residents value sustainable, quality-of-life factors in rural: 1) land/water, 2) community design, function and open-space setting, and 3) community sense-of-place – all of which can be diminished by recreation and tourism or other development and/or sociopolitical conflict.

Public Forest and Agency Roles or Responsibilities in Rural Areas

The major public and private forestland contribution to rural economies and communities is maximum sustainable wood flows.

Public forestland agencies should take responsibility and have explicit goals to maximize or enhance community economic growth (i.e., public agencies should be promoters and partners in rural economic growth and development).

In timber-, grazing- or mining-dependent economies, public agencies can develop unintended codependent relationships that can prolong too much community dependency on traditional basic industries and a dominant "way of life" (e.g., logger or cowboy/ranch cultures).

There are many important forest socioeconomic and environmental contributions to rural economies and communities. Yet, just as in 1950s, adequate private forests will remain only if they meet owner's needs (economic or otherwise); public forests will endure only if politically effective public support is maintained.

The most effective, realistic role for public forest resource agencies is to assist rural economies and communities in adapting to changing regional and global forces (see BLM 1994:3).

Public agencies must help dependent communities cope with denial and resistance to change, and become successful adapters to evolving rural and urban economic conditions – while maintaining desirable cultural and community quality-of-life factors.

Role of Public Forest Managers

Public forest managers are foresters. Foresters largely dominate public forest planning, management and research (Kennedy 1991, Thomas and Mohai 1995).

Professional Mystic Potency Era: We manage "for the good of the resource". Trust us. We know "good" when we see it, and it usually involves more efficient resource production.

Patron Management: Caring, knowing, benign, forester or wildlife biologist expert who manages public lands for the people.

Public foresters protect forests and provide for sustained wood, water or wildlife outputs (McGee 1910).

Objective professional, educated in hard sciences and, perhaps, some economics.

Professionals specialize in separate ecological or user subsystems (e.g., recreation or mining), often located in distinct bureaucracies.

Many types of professions are engaged in public forest planning, management or research today – such as fisheries biologists, landscape architects, soil scientists, economists or ecologists.

Social Value Broker and Facilitator Era: We manage for short and long term social values of sustainable ecological, sociocultural and economic systems (Kennedy and Thomas 1995).

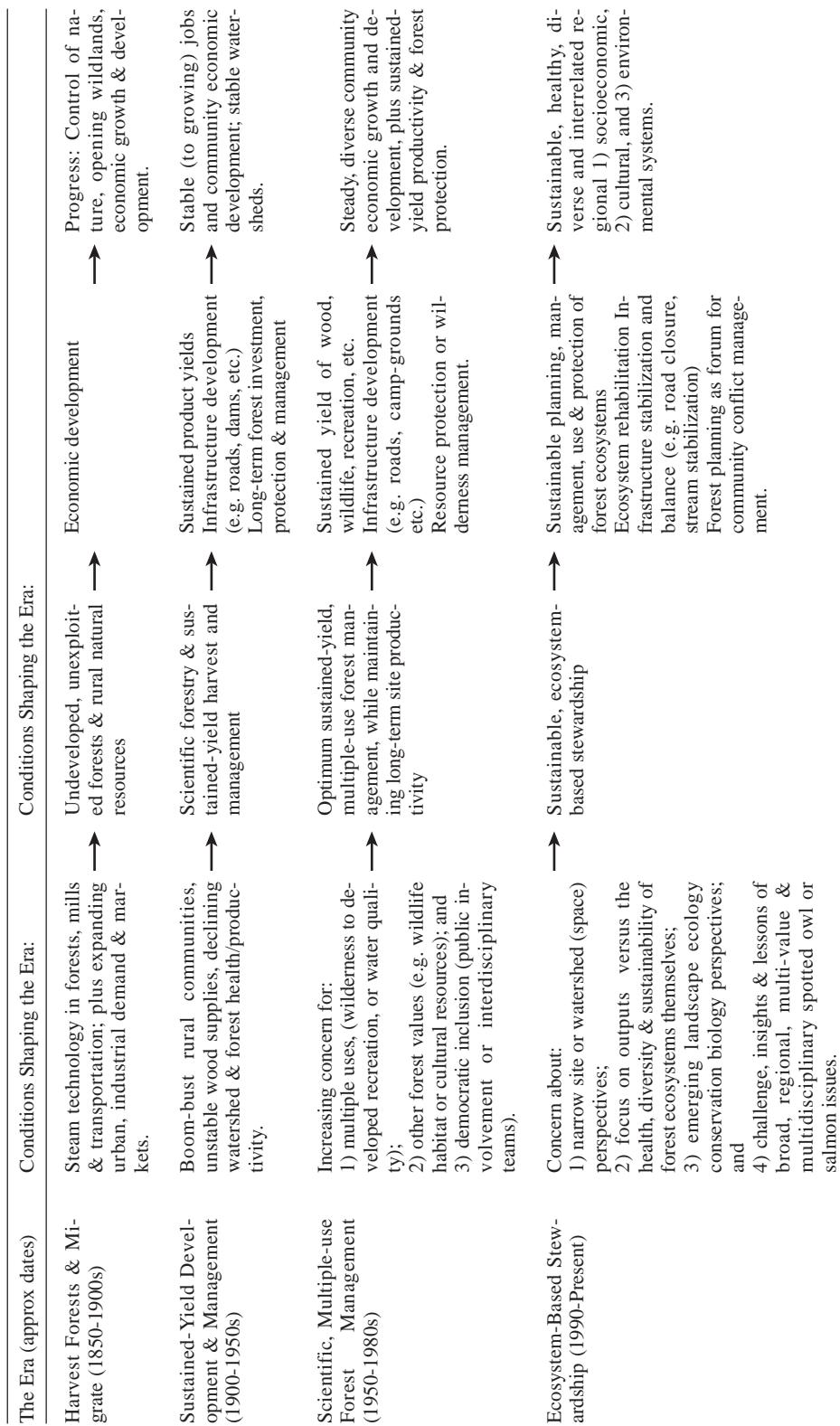
Partnership Management: Facilitate a more open, democratic process of public involvement, conflict management and broad, diverse partnerships.

Public forest managers provide for short and long-term, sustainable flows of forest ecosystem social values.

Hard science balanced and strengthened with philosophy, social science, or communications education – in a broader political, problem-solving context.

Specialization must be linked, validated and operationalized in larger ecological, political and socioeconomic systems.

Figure 1. Evolving perceptions and roles of USA public forest, forest management and managers in rural development.



study of timber-dependent Western Washington counties found that inefficient mill closures and retooling during the early 1980s economic recession resulted in about 25% fewer employees hired when 1990 harvest levels approached historically high cuts of about 15 billion board-feet (Cook 1995).

Even if sustained wood flows normally did achieve desired employment stability, there are many factors today that challenge the maintenance of stable, predictable wood harvests from public lands. Thomas (1995) cited the more important constraints on national forest wood supplies as: 1) natural or ecological variability, especially the impacts of fire, insects or drought, 2) increased management costs and complexity (e.g., environmental impact analysis), plus adequate and predictable budgets to cover them, 3) legislative and other political action, 4) court litigation, and 5) changing values and public involvement impacts.

This is not to suggest that sustained-yield values or the stable flows of adequate forest goods and services be abandoned or diminished. Rather that sustained-yield values and practices be broadened, humbled and integrated into a more inclusive, sustainable eco- and socioeconomic systems planning and management context – as suggested in Table 2. For example, traditional options to enhance forest products and agricultural sectors of rural economies by 1) increased wood harvest, 2) more efficient wood and by-product utilization, or 3) more value-added in processing, crafting and marketing final products, should also consider 4) linking commodity sectors with growing urban needs (e.g., waste recycling) or in partnership with other growing rural sectors (e.g., farm/ranch vacations or bed and breakfast markets).

3.2 Forested, rural USA regions in socioeconomic transition

As in Europe, there is tremendous variability in the current health and future economic prospects for forested, rural US regions. For example, there are the chronic poverty counties of the Appalachian Mountains or the old Southern Cotton Belt (Bliss, Sisock and Birch 1995), where forest products remain major economic sectors. In other forested areas, such as growing retirement destination and recreational amenity counties of North Carolina, Upper Michigan or Northern California (ERS 1995), traditional forest and other commodity sectors are changing rapidly in their direct economic impacts and their direct and indirect support of other growing regional sectors (e.g. recreation).

In traditionally agricultural, ranching, logging or mining regions of the western USA, such as the Rocky Mountains (DeVilbiss 1992) or the Upper Columbia River Basin (Rasker 1995), the trend to rural economic diversity and a service-based economy is strongly evident. The primary resources and economic base of these regions have evolved in ways that challenges traditional forestry and rural economic assumptions, definitions and theories. For example, a study of rural Rocky Mountain economies found that most of the economic contribution of adjacent national forests was from recreation. Only four of the 20 area economies had timber and ranching from adjacent national forests contribute over 1% of their economic base – ranging from 1.1 to 2.4% (DeVilbiss 1992).

Another example of a growing, diversifying rural economy are the Upper Columbia River states of Idaho, Montana, eastern Oregon and Washington. This traditional agri-

culture and resource extraction region has experienced much greater economic and job growth from 1969 to 1993 than the rest of the US – as the proportion of economic activity from their agriculture (11-6%) and resource utilization (7-5%) sectors declined. Non-labor income (34% from retirement, interest, transfer payments) and services (34%) were the dominant economic sectors in 1993, mostly drawn to this region by the same mountains, forests and waters that attracted initial residents and extractive industries 100 years ago (Rasker 1995). Most of these mountains and forests are in public ownership. In the past, having a lot of federal lands in a region was seen as an economic liability. But a recent national study contests this traditional pessimism (ERS 1995). It found rural counties with 30% or more of their land in federal ownership to be some of the fastest growing rural economies in the USA – with growth rates well above national rural averages and close to urban economies. They also had the lowest poverty rates of rural US counties.

Fertile agricultural and forest soils, productive rangeland and forest ecosystems, good watersheds and transportation corridors were some of the important primary resources that traditionally created and maintained basic rural commodity export sectors in the agricultural or industrial stages of Western-world development. The community socio-economic consequences of over-exploiting these primary resources (versus long term conservation) has been recognized for generations. In the 1990s post-industrial world, the economic base of most rural economies was expanded and diversified by many firms that export services, not commodities. Although not as visible as log trucks, grain elevators or cattle herds, recreation/tourism, construction, engineering/design, sales or financial firms that export services are currently the largest and fastest growing basic export sectors for the Rocky Mountains, Upper Columbia River Basin and many other rural US regions. In addition, retirement income and transfer payments account for about one-quarter or more of their economic activity (Rasker 1994 and 1995).

Today the primary resources that attract recreation/tourism visitors, vacation-home residents, new entrepreneurs, retirees and other permanent residents to many rural areas are still much of the same land and water that supported commodity export sectors of the past (and present). But more diverse quality considerations of 1) these natural and environmental resources (e.g., scenic or recreational quality), and 2) the community character (e.g., pace of life, low crime and congestion, good education, etc.) are important in these "new economics of rural location" (Dillman 1979, Williams and Sofranko 1979, Frey 1987). Conserving these primary natural and community resources are as critical to the sustainability of new rural economies and communities in a post-industrial world, as conserving soil and water productivity was in previous eras (UN 1987, CEQ 1989 and 1995, President's Council on Sustainable Development 1996). These traditional and new primary resources are often referred to as "quality-of-life" factors (e.g., Hyman 1994, Rasker 1994). They can deteriorate physically through incompatible or too much compatible use and development. They can deteriorate socially by poorly planned growth and sociopolitical conflict between established and new residents that diminish attractive, friendly communities.

3.3 Evolving goals and roles of US public forest agencies

In response to changing public forest values (Kennedy and Thomas 1995) and their mixed success with providing sustained-yield employment, agencies such as the USDA-Forest Service or Bureau of Land Management have shifted their rural development roles from partners and promoters of rural economic growth, to helping facilitate effective community adaptation to broader socioeconomic change. This is quite a transition from the forceful and confident role the USDA-Forest Service (1970:7) stated in its first national goal statement of helping rural areas achieve economic growth rates equal to or greater than "the national average". Such goals are stated more humbly and comprehensively today as: "Help states and communities to wisely use the forests to promote rural economic development and a quality rural environment" (USDA-FS 1994:8). The Bureau of Land Management's (1994:3) current rural development goals are even more expanded and integrated with diverse community values and governance as: "Help local communities anticipate and adjust creatively to changing environmental, social, and economic conditions." Rather than what these agencies hope to do to economies (e.g., create growth), these new goals propose a partnership process of working with and within interrelated community cultural, economic and governance systems.

3.4 Effective agency and rural community partnerships that promote sustainable socioeconomic development and avoid dependency-traps

Rural areas usually respond to disruptive change in a sequence of stages:

1. traditional, comfortable balance and order,
2. change in or outside rural systems,
3. tension and conflict in traditional and emerging systems,
4. issue recognition, option consideration and adaptation, and
5. new synthesis.

Freudenburg (1992) observed that heavy regional dependency on logging, ranching or mining economies (and their way-of-life) can often lead to myopic, rigid and unintentional "addictive" community behavior that often limits successful community adaptation to a rapidly changing world. Such strong economic and ego dependency on (i.e.) a logging or ranching economy and way-of-life can stall community adaptation in denial and reactionary anger at stage 3 (above), foreclosing future options.

Given the rural identification and the way many forest managers were traditionally educated, the desire to support such rural economies and life-styles is understandable. The ultimate result, however, can be well-meaning natural resource managers becoming codependent supporters that prolong community denial of needed adaptation to a complex, changing post-industrial world – a world that is largely beyond local control. Public resource managers might also unintentionally become codependent contributors to community polarization of traditional logging or fishing residents in conflict with newly arrived retirement, entrepreneurial or vacation home neighbors, all likely to contribute to less desirable communities to live and invest in that cannot effectively cooperate to envision and pursue desirable futures – including the sustainable use and

protection of their forest ecosystems and other primary resources. Fortunately, the involvement of the Bureau of Land Management or Forest Service in rural community "adaptation" processes (versus growth engineering) can also diversify public manager's community contacts and awareness of broader, more effective, sustainable community adaptation options that reduce dependency on limited economic sectors. As the CED (1993, 4) concludes, the greatest contribution public officials can make to regional economies is an "enhanced capacity for choice." Addiction limits choice. Codependency usually prolongs addiction.

The limits on healthy, sustainable rural communities in the next century may not only be the traditional capital or technology constraints of this century. Unresolved, destructive, regional sociopolitical conflict in adapting to the diversity of recent residents, recreationists or new economic sectors can be just as much a constraint. And this conflict may not only be limited to early community developmental stages of established residents and politicians resisting new ideas and residents. It can also continue as recent residents and emerging anti-growth values elect new officials that want to apply mechanistic no-growth policies, further polarizing rural communities in transition and threatening the sustainability of their primary ecological and other quality-of-life resources (President's Council on Sustainable Development 1996).

3.5 Evolving roles of public forest ecosystem managers

The last part of Table 2 depicts a time when the American people often allowed foresters to be the primary decision-makers on public forests. In the first two-thirds of this century, the public and other professional colleagues were trusting and otherwise too involved to engage foresters in the complex, diverse and challenging processes of democracy (Steen 1976, Kennedy and Quigley 1993). No longer! Public forest management today, including its impact on rural community development, is usually much more of an interdisciplinary, public-involved, democratic process (Kennedy 1988 and 1991, Thomas and Mohai 1995). As complex and messy as these new planning and management processes have become, they demonstrate increased social value of these forest ecosystems and public exercise of democratic access – demanding a more mature public partnership with public land managers than in the good old days of trusting, "patron" forest management (Table 2).

More than just physical ecosystem managers, foresters and their natural resource colleagues today are often social value brokers and conflict managers (Kennedy and Thomas 1995, Kennedy, Fox and Osen 1995). The sustainability thinking that we are learning to apply to the land, must expand from a biological, ecosystem focus to incorporate regional economic, sociocultural and governance systems. Rather than just ecosystem managers, public land management must be more broadly focused on sustainable systems management (including eco-, sociocultural and economic systems) – as suggested by the CEQ (1995) and the President's Council on Sustainable Development (1996).

In the American West, large and valuable public lands have forced established residents and agencies to engage in much more inclusive and challenging democratic processes with new values and new residents, than if these public lands and democratic access to their management did not exist. If these public lands had become mostly

private (as in Texas), oligarchy might likely dominate their governance; and current, challenging, democratic processes would be less involved in the future of western ecosystems and their human communities (Wilkinson 1992). Ironically, many public natural resource managers who selected their professions to escape the complexity, ambiguity and challenges of messy sociopolitical processes, now find themselves in the vortex of them. How well they develop the attitudes and skills to respect, facilitate and implement democratic processes will not only affect the sustainability of the land and rural communities, but perhaps the sustainability of civil, democratic processes in a major part of a nation. A challenging and intimidating topic of reflection.

For some US natural resource professionals, this transition from traditional, more simple and independent "forstmeister" status has been mourned as a considerable reduction in power, prestige and status. Egoistic, patron manager status did have its personal and professional rewards (Kaufman 1960, Miller and Gale 1986). But it also demanded less of us professionals and of the citizens of a democracy. For better or worse, that era of patron public resource management is passing in the USA. If forest managers cannot evolve from center-stage "forstmeisters" to a more humble, integrated role of "midwives" in a democratic processes of sustaining forest ecosystems and rural communities, we will have a much diminished public role in the 21st century. And we will have earned it (Kennedy and Koch 1991, Kennedy and Thomas 1995).

4. CONCLUSIONS

To be relevant and effective in the 21st century, forest management and research must be positioned in a broader, more inclusive ecological, economic and social context. We must challenge and adapt our traditional thinking and past societal roles, if we are to be as helpful in current adaptation to the post-industrial transition as we were in the industrial revolution (Knight and Bates 1995).

This does not imply rejection of traditional natural resource conservation values and beliefs – rather a maturation and integration of traditional conservation thinking into a broader sustainability context (CEQ 1995, President's Council on Sustainable Development 1996). This would be a maturation and evolution from:

- forest site, narrow ownership and biological thinking to... broader, more integrated watershed, ecoregion and socioeconomic views.
- myopic wood or wildlife resource (stuff) focus to... incorporating traditional product and broad urban and rural social values into ecosystem planning, management and research.
- traditional users and resident orientation to... new urban and rural values and clients, as well as generations unborn.
- intensively managed sustained-yield forests for regional economic growth to... sustainable, high quality, diverse regional ecosystems, economies and communities.
- rural development = economic (base) development to... rural development = sustainable social development, with important political, environmental and economic systems components.

- independent, benign, expert “forstmeister” status and societal role to... involved partners in challenging and assisting communities to cooperate in shaping sustainable futures.
- foresters managing forests for the US public to... natural resource professionals who manage public forest ecosystems with the people.

For many of us forest managers, this transition process is a challenge to our intellect, egos and hearts.

Most rural communities will still rely on forest and natural resource in the next 100 years, as much as in the 19th or 20th centuries. But this reliance relationship is changing in amount and type (quality), and more jointly shared with urban residents. In the industrial revolution, forest relationships with society were usually defined mechanistically as sustained flow of wood or water. This was a significant and socially important contribution of the conservation movement. But the 21st century invites more comprehensive, inclusive organic-model beliefs in understanding and encouraging sustainable rural eco-, socioeconomic and political systems – in a broad rural-urban and global context. Forest managers, local communities and the general public must find ways to balance and integrate past conservation values, uses and rural communities (whose cultural identities and economies still depend on them), with broader, more diverse forest social values, uses and changing rural communities. Otherwise sociopolitical conflict could become the major constraint to healthy, sustainable forest ecosystems and to rural community development in the 21st century. Research must assist natural resource professionals and a diverse public in this expanded, more inclusive forest planning, management and learning process.

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STYLES OF FOREST MANAGEMENT BY SMALL FOREST OWNERS, CHARACTERISTICS AND SCOPE FOR RURAL DEVELOPMENT

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ABSTRACT

About one half of the European forests are privately owned, many of them by small forest owners. In this paper the main characteristics of small forest owners will be described as well as their motives and objectives regarding forest management. Small forest owners (SFO) are defined as those forest owners, for whom forestry forms only a partial activity within their total livelihood system and whose forest management objectives are not predominantly oriented to industrial timber production. Two basic types of small forest owners may be distinguished, i.e., farm foresters and other small non-industrial private forest (NIPF) owners. A further subdivision is possible on the basis of the functions of forests for various categories of owners. For instance, forests may have the following major functions for farmers:

- Acting as a functional component of the farming system by providing input that can be used for crop and livestock production processes, e.g., mulching material, fodder, wind protection.
- Acting as an economic resource in the farming system by providing opportunities (e.g., commercial wood production, recreation facilities) for economic activities which are in addition to agricultural production.
- Acting as a financial reserve or means of investment.
- Acting as a cultural resource due to their history as ancestral lands and/or their value towards improving the working and living environment.

As a result of these multiple and partly overlapping functions of forests for farmers, different farmers may perceive forest resources in quite different ways, and consequently, the motives and objectives for management may be quite diverse. A similar variation in motives and objectives for forest maintenance may be found among NIPF owners. Small forest owners have therefore developed a variety of quite distinct styles of forest management. Each style of management represents specific connections between economic, social, political, ecological and technological conditions. In the past the SFO management styles were often considered to be of marginal relevance in comparison to

professional styles of forest management. But at present it is increasingly recognised that the various styles of SFO forest management may provide important examples for further integration of forestry in rapidly changing rural conditions.

1. INTRODUCTION

About one half of the European forests is privately owned. This category of forest ownership is extremely varied, ranging from a few estates with thousands of hectares of forests, to the millions of holdings with less than 5 ha. Generally, it is assumed that the management situation of the small forest holdings is unsatisfactory. For instance, in a recent review of the state of European forest resources (Kuusela 1994), it is stated: "Many of the poorly managed and neglected forests are owned by private people with small holdings (...) The problem of small forest units is well known and much discussed, but difficult to solve". As reasons for this unsatisfactory situation, various factors have been indicated both with respect to the forest owners' lack of proper skills ("small forest owners lack the incentive c.q., interest and the forestry training") and the nature of the forestry holdings ("a small forest holding cannot be managed economically on its own", e.g., because of "the difficulty of obtaining larger items of equipment") (Hummel 1989). Such statements suggest that there is only one most rational way of managing forests. It does not leave room for consideration that forest management may take on quite different forms under various types of economic, social, political, ecological and technological conditions. However, in this paper it will be argued that small forest owners do apply their own distinct styles of forest management which are different in nature to those applied in public or industrial forests.

In the past decades much progress has been made to rationalise forestry in order that it could contribute more effectively to the solving of problems of wood shortage. However, due to the changing requirements of society, forests are expected to fulfil more diverse functions at present. The challenge thus becomes one of readjusting management towards the provision of a satisfactory amount and mix of social values for the present generation (Koch and Kennedy 1991). In order to be able to do so, it would seem to be a realistic option not to base development efforts on professional forest ideologies (Glück 1987) which arise in response to problems in the past, rather to base them on a new empirical understanding of the variety of motives and objectives of forest owners to maintain forests and the subsequent variety in forest management styles (Kurtz and Lewis 1981, Bliss and Martin 1989, Gerritsen 1995, Wijnia and Houwaard 1995).

A style of forest management may be considered the forestry equivalent to a style of farming (Van der Ploeg 1994). Such a style of farming may be considered, in the first place, to be a particular cultural repertoire that regards farming as it ought to be organised. Secondly, a farming style embraces those particular practices that are inspired and formed by this repertoire. Thirdly, a farming style regards the way a farm enterprise is linked to the markets and to the dominant supply of technologies. Therefore, a farming style can also be considered (in the fourth place) as an actively constructed response to dominant models inspired by agrarian policy. In analogy, a style of forest management may be defined as a particular way of maintaining forests within the total livelihood

practices of a landowner, with the repertoire of management practices being based on the landowners' specific objectives as shaped by both his own motives for land-use in general and the external conditions under which he operates.

In this paper using the concept of "style of forest management" as a starting point, an assessment will be made of the motives and objectives of small private forest owners for maintaining their forests. The process of decision-making with respect to forest management will be characterised as being highly actor-dependent. The specific types of forest management activities of small forest owners will be described as the product of an integrated set of motives and objectives of small forest owners within the context of their livelihood strategies. It will be argued that a better knowledge of such management types may provide important new insights about the specific contributions which small-scale forestry may make in accommodating the changing requirements with respect to the role of forests in rural development.

2. WHO ARE THE SMALL FOREST OWNERS?

Among various European countries, variable traditions with respect to small-scale private forestry exist (Brandl 1993, Grayson 1993). This is reflected in a considerable variation with respect to the percentage of forests which are privately owned as well as the average size of such holdings. In most countries a large proportion of the holdings is less than 10 hectares in size; only in the Nordic countries is the average size about 30 ha. or more (Table 1).

As they decrease in size, small woodlots gradually fuse with agroforestry systems of tree growing combined with agricultural cultivation; in other cases the forests may also

Table 1. Importance of small-scale private forest owners in selected European countries (UN-ECE/FAO, 1992)

	Privately owned forests & woodlands				
	Farm & other private forests				
	Total forest area (1000 ha)	Total area, % forest land	Area (% private ownership)	No. holdings	Average size (ha)
Austria	7.088	90	50	227.774	14
Belgium	620	56	100	11.000	3
Denmark	466	73	90	35.700	9
Finland	20.086	68	86	426.303	28
France	14.326	68	100	367.700	3
Germany	6.872	42	100	441.856	7
Norway	9.206	73	100	145.075	46
Portugal	3.102	91	93	373.669	7
Spain	25.972	70	98	4.822.541	4
Sweden	28.015	70	67	248.879	53
Switzerland	1.189	32	100	251.700	2

be used for grazing. Consequently, often no clear distinction between small woodlots or agroforestry systems can be made. In many European countries a tradition exists maintaining such agroforestry systems. Especially in South Europe this long-established practice still prevails in several regions, e.g., the dehesa system in Spain, and in Italy, the "three-floor-farming" system in Emilia Romagna; and agro-silvo-pastoral farming system in Umbria (Joffre et al. 1988, Giordano 1994). In Central, Northern and Eastern Europe agroforestry plays a less prominent role, although wooded hedges, amenity plantations and grazing in orchards and other tree plantations may be found in many regions (von Maydell 1995).

Because of this variation in the nature and size of forest holdings and tree stands, small forest owners will not be categorised by size of forest lands in this paper, rather by the specific features of forest management. Small forest owners (SFO) are defined as those forest owners, for whom forestry (including agroforestry) forms only a part activity within their total livelihood system and whose forest management objectives are not predominantly oriented to industrial timber production. Two basic types of small forest owners may be distinguished, i.e. farm foresters and other small non-industrial private forest (NIPF) owners.

Traditionally, most small forest owners were farm foresters. This category of forest owners came into being in the 18th and 19th centuries when, in most European countries, liberal policies stimulated the transfer from the traditional common property forest ownership rights to private property rights (Brandl 1993). These farm forests formed an important resource base for supporting agriculture as well as providing a supplementary income in times when labour requirements in agriculture were low. The function of forests to provide input for agriculture (e.g., mulching material, fodder) has decreased in importance with the advent of modern agricultural technology. Consequently, in many regions the amount of forest land belonging to combined farm and forest enterprises decreased. For instance, in Sweden the area of such forests decreased from nine million hectares in 1940 to four million hectares in 1990 (Roos 1996). Nonetheless, in many European countries, farm forestry still prevails with farmers protecting and maintaining forests because of their multiple functions within the farming system and countryside.

Since the middle of this century, a second category of small forest owners has gradually developed, i.e. non-farm, non-industrial private forest owners. This category of forest owners partially consists of (descendants of) former farmers who shifted to other economic activities than farming, but kept their (forest)land. But increasingly, these forest owners consist of urban people who bought the forest plot as either an investment or as a resource to be used for recreational activities (Plochmann 1976, Reunala 1975, Lucassen and Engel 1983). Thus, the main function of small-scale forestry is gradually changing from serving as a source of production and additional income to farming, to serving as an addition to wage labour and as a means of private investment (Gaunitz 1993). This evolution seems to be most advanced near the industrialised regions of Europe, but in many rural areas farm forestry still prevails. To present, most studies on small-scale private forestry have been directed at farm forestry; research on the characteristics of the other types of non-industrial private forestry is still scarce. Consequently, the attention will be mainly focused on farm forestry in this paper.

3. THE POSSIBLE ROLE OF SMALL FOREST OWNERS IN RURAL DEVELOPMENT

In the official forest policies, small-scale forestry is often considered a constraint to proper forest management. Both its ability to optimise timber production as well as its ability to contribute to other functions than timber production are often doubted. Two kinds of arguments are put forward for this prevailing policy view:

- Lack of economy of scale for proper management:
“It should be relatively easy to develop management regimes which satisfy the multiple needs in public and industrial forests as well as in large and medium-sized forest holdings owned by private people. Where the average size of private holdings is very small, forest work can not be rationalised and mechanised properly, as the income per owner is too low to maintain economic interests.” (Kuusela 1995).
- Lack of financial returns for other functions than timber production:
“Especially the smaller owners tend to look for an earlier return on their investments than society and they have little incentive to welcome the public into their woodlands free of charge” (Hummel 1989).

However, several studies have indicated that the assumption that small forest owners manage their forests for profit maximisation mainly, or otherwise neglect them, is not warranted. Rather, the behaviour of these forest owners is often based on the wish to receive not only monetary but also non-monetary returns from their forest investments:

“It is the whole return on the capital investment which occupied the proprietary mind and that return included all aspects of amenity, recreation, sport and conservation” (Johnson and Nicholls 1991).

Small forest owners can therefore best be characterised as being utility maximisers rather than profit maximisers (Hyberg and Holthausen 1989). This is reflected by the findings that forestry incentive programmes aimed at stimulating increased rates of timber production in small forest holdings have in several cases not been successful (Clark and Johnson 1993). One of the reasons for this lack of effect was that forest owners used the incentives as a tools for increasing the amenity and landscape values of their forests rather than increasing their forest income from timber production (Hyberg and Holthausen 1989, Johnson and Nicholls 1991). This illustrates that the interests of small-scale forest owners do not always coincide with national interests (cf. Jensen 1993). However, such observations should not be assumed to reflect that these forest owners do not operate in a rational way. Rather, this indicates that there may be many reasons for managing forests. Forestry development policies should recognise such diversity rather than assume that the management systems developed for public and industrial forests are the only rational way of managing forests. Because wood production often has a relatively low priority for the small-scale forest owner, while other functions are relatively more important to him, it might well be that the practices of these forest owners could provide interesting examples of how forests could be managed in an alternative way in order to contribute towards innovations in rural development.

That such a possibility should not be considered as being hypothetical has been amply demonstrated in tropical countries as a result of the development of what has been

called social forestry (Persoon and Wiersum 1991, Raintree 1991). But in Europe there are also indications that this approach is a promising one. An interesting example is the “Streuobstanbau” agroforestry system in parts of Germany. This historically developed agroforestry system was first considered to no longer be economically viable, but is now again being stimulated because of its great ecological and aesthetic values (Dabbert 1995). In order to assess the scope of this possibility in more detail, it is necessary to take a closer look at the characteristics of small-scale forestry.

4. THE ROLE OF FOREST MANAGEMENT IN LIVELIHOOD SYSTEMS OF RURAL PRODUCERS

In forestry systems as applied in public and industrial forests managed by professional forestry organisations, forest management is based on the idea that forests should be managed as a specialised enterprise. But for farmers and other small forest owners, forest management consists usually of a partial activity within their total livelihood strategies. For nearly all small private forest owners, their forests are not their main source of income. As indicated above, traditionally, these forests are primarily maintained because of their contribution to the functioning of the farming system, while more recently, forest ownership may also be combined with different types of non-farming employment.

As a result of the multifunctional features of forests, there may be various reasons for farmers to incorporate forests within their farming system:

- Providing supplementary production of valuable products for household consumption (construction material, fuelwood, wild fruits and other food products) or sale.
- Providing opportunities for supplementary economic activities (e.g. on-farm camping) in addition to agricultural production.
- Maintenance of landscape values, including shelter and wind protection for crops and livestock.

Due to these reasons, forestry has already been long time integrated within the farming system in some countries/regions. In Sweden for instance over most of the 20th century more than half of the farm and forest land owned by peasants who combined arable land and woodland into property units worked by the family (Gaunitz 1993).

But in other countries/regions, a segregation between agriculture and forestry has developed. Sometimes, these two situations even co-exist, with forests having quite different values for different categories of landowners. For instance, in Ireland it has been reported that “there is a complete lack of forestry tradition among the farmers. Indeed there has been a traditional antipathy of farmers towards forestry, because in the past forestry was associated with large estates and the small farmer looked enviously across the walls of these estates at the “recreation” forests” (Dhubáin and Gardiner 1993).

As indicated by the above example, quite different attitudes of farmers to forestry exist. In some regions, forestry forms a well-appreciated form of land-use which can well be integrated with other types of land-use. But in other regions, farmers exhibit a disinclination to become engaged in woodland management. In such cases, forestry is re-

garded as a separate enterprise which is not easily incorporated in the existing patterns and cycles of the agricultural system. But even in regions such as Central Scotland, where the planting of trees as a potential source of income was viewed by most farmers as irrelevant, trees were still considered to provide useful shelter and to have a beneficial landscape amenity function (Clark and Johnson 1993).

5. SMALL FOREST OWNERS' MOTIVES AND OBJECTIVES FOR FOREST MANAGEMENT

The objectives of small forest owners regarding forest management and the motives on which they are based may be quite diverse. These motives may be considered the guiding forces which motivate the decisions of small forest owners with respect to forest management. Various studies, both in the USA and several European countries, indicate that five major kinds of motives may be distinguished (Kurtz and Lewis 1981, Bliss and Martin 1989, Johnson and Nicholls 1991, Karppinen 1995):

1. Financial returns: obtaining income on a regular basis, not necessarily annually but within a time span allowing for consistent returns from management. Although in most cases timber is considered to be the foremost revenue earner, in several European countries speciality wood products and non-timber forest products such as berries, mushrooms, greenery, game (Thomas 1993) may also contribute in a significant way to the income of forest owners.
2. Investment: maintaining ownership for its increased value over time. In this respect important aspects influencing motivation are the potential for future sale, risk aversion, income in emergencies as well as scope for development of forest-based recreational or tourism facilities. In many cases, the increase in value is not only, or not even primarily, related to future forest production, but to the increase in value of the forest land.
3. Residence: desirability for permanent residence or holiday cottage in a forest environment. This motive may well go together with the investment motive as prices for building lots in a forest environment are often higher than in open landscapes.
4. Satisfaction and aesthetic enjoyment of the intangible landscape qualities of the forest environment.
5. Social responsibility: preserving forests for future generations.

Obviously, these different motives for maintaining small forests are not necessarily mutually exclusive, some may be even interrelated.

It should be remarked that all of the above motivations relate to reasons for maintaining forests as a goal in itself. But as discussed earlier, in several cases the main motive of small forest owners for maintaining forests is the possibility of using them as a means for income generation in an integrated enterprise. Traditionally, this mainly concerned the possibility of using forests and trees as an input for the agricultural production process. But increasingly, a new form of integration with other income generation activities is developing. The nature and landscape values of forests are not only enjoyed by the

owners, but also by tourists and recreationists. Forests may therefore also be maintained with the motive of using them as input for a recreation enterprise.

The various motives for maintaining forests are reflected by the different objectives of their owners in managing these forests. For instance, in Finland small forest owners have been classified on the basis of their management objectives into multi-objective owners, recreationists, self-employed owners and investors (Karppinen 1995). Obviously, the management objectives will vary amongst different socio-economic groups and between different locations (Table 2). These different objectives result in important variation in the forest management practices which used by different categories of forest owners (Mensink and Tiemersma 1990, Johnson and Nicholls 1991, Karppinen 1995, Loyland et al. 1995). Such management practices are not always directed at stimulating the growth and yield of timber production; rather in several cases they are directed at minimising costs for maintaining intangible forests qualities.

Indeed, various indications exist that during the past decades of growing public concern about the environment, the non-financial motives have become increasingly more important. For instance, in the UK it was found that whereas in 1964 3% of estate owners managed their woods mainly for the object of conservation and amenity, in 1986 this had risen to 20% (Johnson and Nicholls 1991). It may be expected, that the increase in small-forest ownership by non-farmers, including many urban dwellers, also contributes to a gradual increase of non-financial motives for maintaining small forest plots.

It can be concluded that the motives and objectives of small forest owners in managing forests may be of a varied, albeit partly overlapping nature. In some cases, the motives for managing forests are primarily utilitarian ones with trees either being considered a financially attractive crop, a means of investment or a means for maintaining the "infrastructure" of a farming or recreation enterprise. In other cases, the motives are primarily of an emotional nature with the forests having historical and/or natural values. Such motives do not only play an important role in how small forest owners manage their forest holdings, but also how they gradually adjust their management towards the evolving rural conditions. The following case study illustrates that rather than just following policy models, small forest owners may be engaged in their own types of endogenous, and often location-specific, development projects (Van der Ploeg and Long 1994).

Table 2. Objectives in forest management for different ownership categories and locations in the UK (% of response) (Johnson and Nicholls 1991)

	Estates	Farms / Wales	Farms / England
Number of units surveyed	68	25	25
Objectives:			
Timber production	52	8	4
Profit & capital value	25	4	12
Conservation & amenity	20	24	80
Shelter	0	28	0
Game	1	20	0

6. ENDOGENOUS DEVELOPMENT OF FOREST MANAGEMENT BY SMALL FOREST OWNERS

In the so-called “Friesian Woodlands”, an agricultural area in the north of the Netherlands, one encounters an interesting example regarding the balance between farming on the one hand and the maintenance of landscape and nature values on the other. In the previous century, the prevailing landscape was rebuilt, as it were, by farmers. Hedges, densely populated with different kinds of trees and shrubs were created in order to provide boundaries between the small farming fields. This was not only functional in as far as it prevented the growing number of cattle from running from one field to another (thus providing for more control and better grassland management) – the hedges also protected the arable plots (for fodder beet, grain and potato production) against wind. Thirdly, the hedges provided the required wood, both for construction and for heating, and finally, it turned out that a wide range of predators of agricultural pests developed in the hedges. Hence, the hedges represented a clear and undisputed economic as well as agronomic value. Consequently, through the practice of farming, itself, these hedges were continuously reproduced (that is maintained, improved and renewed), which meant that a beautiful “corridor”-landscape, especially rich in (bio-)diversity was maintained and even enriched.

It is calculated that, on the average, up to 24% of every hectare was covered by trees. These densely forested parts (located on the higher sandy soils) contrasted nicely with the neighbouring open hayfields (located on the lower-lying lands with a high water level) which again represented specific natural values. The extensively used hayfields and the intensively used woodlands were held together within one and the same farming system, being the “art de la localité” (i.e. local farmers’ knowledge) on how to use the available resources (“nature” included) as a crucial prerequisite for its reproduction (De Bruin and Van der Ploeg 1992).

From the mid-fifties onwards, agrarian policies in the Netherlands became increasingly oriented towards modernisation of farming: scale-enlargement, specialisation and intensification became the key words. These were supposed to point the way to the desirable development of the single farm enterprises. In the Friesian Woodlands this new agenda for development increasingly implied that the historically created landscape became redefined as a “hindrance” for progress. The hedges and other landscape elements not only lost their economic value, they became a barrier for modernisation. And as a matter of fact, in many areas of the Netherlands, the indicated landscapes were literally removed under the state programmes for spatial reorganisation (the so-called “ruilverkavelingen”). Alongside these “removals”, new small forests were created under the regime of the State Forest Service. However, the “separation” of the once neatly integrated elements (i.e. agriculture and woods), concerned only the reconstruction of a fraction of the once available, but highly scattered landscape-elements. Simultaneously there was, as biologists and ecologists concluded, an impoverishment of bio-diversity at the level of both species-richness and landscape diversity. “Separation” is not always the best strategy for the defence of landscape and nature values.

For a variety of cultural and historic reasons, development took on a different trajectory in the Friesian Woodlands. Although many valuable landscape elements were degraded (and sometimes even disappeared), it is remarkable, though, how much was pre-

served and sometimes even revitalised. Especially important was the emergence of a particular farming style that corresponded, in the first place, with the historically produced landscape pattern and which was developed, secondly, through the past decades into a kind of farmers' response to the dominant model of "farming in a modern way".

In the Friesian Woodlands, farmers especially developed the style of farming economically. That is, they tried to keep the monetarian costs as low as possible, simultaneously trying as well as possible to use the available (internal) resources. Farming economically also regards the balance between own capital and capital mobilised through the capital market. Debts and financial requirements, and consequently, the need to accelerate farm expansion, were all kept at a minimum. Simultaneously, these farmers developed, more than in other areas, a range of activities now frequently identified as pluri-activity. Pluri-activity regards both agrarian activities (e.g. the combination of dairy-farming with breeding) and non-agrarian activities. Through all these adaptations, an effective "mediation" was created between the general trend towards modernisation (with the inbuilt need for "separation") and the prevailing landscape.

During the past years, events reached a climax. On the one hand, the new environmental policies introduced the need to work with new technologies for the injection of manure into the subsoil. The associated machinery is definitely at odds with the prevailing small-scale landscape. Simultaneously, it is through the landscape policy of the state that large parts of this area are threatened by expropriation in order to be converted into "nature reserves". On the other hand, it is becoming quite clear that the reproduction of the available landscape (and the embedded natural values) is hardly possible without farming activities.

In this setting, a breakthrough was created by the creation of several new farmers' organisations which explicitly aim at maintaining landscape and nature values through an adapted way of farming incorporating forest management. Building upon the already developed style of farming and having developed a well-integrated plan for the area as a whole, they asked for the required financial support and for the required room for manoeuvre (implying the possibility of developing adapted techniques for manure distribution a.o.). They recently received a positive reply from the minister of agriculture and so far organised an additional income flow to the area that is beginning to match the costs associated with this farmers managed landscape and nature preservation.

7. THE NEED FOR RESEARCH ON THE SPECIFIC MANAGEMENT STYLES OF SMALL FOREST OWNERS

As indicated by the above information, a particularly interesting but also worrying phenomenon is that it is increasingly shown that there is a considerable "mismatch" or "disconnection" between the available scientific and policy knowledge regarding forest management, on the one hand, and small forest owners' motives and objectives for forest management on the other. Farmer managed afforestation and farmer managed conservation of landscape elements is hardly ever on the research agenda of applied science. Although small-scale private forest management has been, and in many cases still is, an omnipresent phenomenon throughout Europe's countryside, and whilst it

could again become a highly promising feature in the near future, empirical research on it is still very limited. Such research should not only be analytically oriented to describing the specific features of such management styles, including the motives and objectives underlying them, but it should also contain a clear “design-dimension” (as in the case of the Friesian farmers). It should also regard the interface between policy and practice. Just making subsidies available is not only rarely sufficient, it quite often turns out to be highly counterproductive, if not destructive, as is shown by the following example.

The landscape of Umbria and the Tuscany in Italy is not only characterised by its well-known farming practices – it is also increasingly dotted with holdings that serve as dwellings for urban professionals. The meadows and arable lands belonging to these holdings were used, until recently, by surrounding farmers mostly on basis of a yearly contract. This practice is a relief for the farmers, since it allows them some expansion without entering into high investments. On the other hand, it is also a relief for the urban professionals: their land is tilled, which implies that the danger of shrubs, bushfires, snakes, etc., is avoided.

Currently, however, this mutual arrangement is under heavy pressure, precisely because of the high subsidies for afforestation provided by the EU. The holdings around the dwellings of urban professionals are quickly changed into woods (without any capacity to maintain them), and the surrounding farmers are losing a considerable part of the “space” they need so urgently. It is clear that this scheme will have a regrettable outcome within the coming decade. Even more worrying is that specific alternatives for re-integrating forestry into farming have been completely neglected.

8. CONCLUSION

Small forest owners mainly manage their forests in a way which is quite distinct from the management regimes of public or industrial forests. These management styles should not be considered marginal or non-rational, rather as the expression of the specific livelihood strategies of the small forest owners within the context of the location-specific social space (Selby and Petäjisto 1994, Van der Ploeg 1994). In many cases these management styles have been directed at maximising the utility value of forests rather than at profit maximisation. At present, forest policies are increasingly recognising the multiple functions of forests. Forests may not only contribute towards rural development by acting as an alternative source of production, but also by increasing the amenity and nature values of the countryside. Especially with respect to the integration of these values in forestry programmes aimed at rural development, the specific management styles of small forest owners may provide interesting examples. The further adaptation of these styles may contribute towards the reconstitution of location-specific landscapes (Van der Ploeg 1992) with a high value for both recreation and production of speciality products (Hees et al. 1994). In order to reorient farming and small-scale forestry towards such a new balance, i.e. a new integration, it is essential that the prevailing interface between policy and practice is reconsidered.

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PROTOCOL OF DISCUSSIONS

The protocol was produced using recordings of the discussions as well as personal notes. The contributions are summarised; whenever possible the name of the individual participant is mentioned (unfortunately, some participants did not identify themselves at the beginning of their statement). The protocol does not claim completeness, since some of the statements could not be identified properly on the records (some speakers did not use the microphones), however it should give an impression of the main ideas expressed in the discussions.

DISCUSSION 1

Monday, 11:30 – 12 AM

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SUMMARY OF THE DISCUSSION

The discussion focused on the identification of stakeholders, their attitudes, and the consequences of these attitudes. The need for foresters to change in order to adapt to new demands by society and in order to continue being assigned the competence for managing forest ecosystems, was stressed in several contributions. It also became evident that there is a need of knowledge about peoples' attitudes toward forests. Simply differentiating between urban or rural populations or forest owners and non-owners might not proof sufficient, since large differences exist within these groups. Several contributions referred to the role of forestry education, which in the future will have to

put more stress on the social and political skills of foresters that will gain in importance due to the perceived developments. Apart from a lot of similar perceptions in all represented countries, however, the discussion also revealed differences in the preferred approaches.

With regard to the dominance of small-scale forest ownership all over Europe, Prof. Koch noted the importance of directing more research towards the attitudes of small-scale forest land owners, whose relation to forestry could only be understood in the context of their overall livelihood activities. He also stressed the existence of a large diversity of management goals among small-scale forest land owners, for many of whom he assumed that amenity goods and values are of great importance.

The topic of ownership structure was also treated in a response by Prof. Kennedy, who noted that despite regional differences, the overall ownership structure in the US is not that much different from European conditions. In accordance with the structural development in rural areas, in the US nowadays there also exist a growing number of forest land owners with a non-rural professional background, who may be descendants of farmers, or who have bought forest land recently. For many of them, recreation, hunting or fishing are more important than timber production, both for their personal leisure as well as a source of income.

Prof. Kennedy also pointed to the necessity of introducing into forestry education a greater understanding for diversity, both on a biological as well as on a social level. Answering a question by Prof. Glück, he brought up the influence of role-models which teachers represent to their students and the responsibility that thus arises for academic staff.

Prof. Vos expressed the need to involve the urban population, which has always been the real client of forest products, into the definition of forest management goals, which in turn, might also increase the marketability of new products. He also asked the auditorium how they thought this involvement might be realised.

Not only the diversity between urban and rural populations, but also the diversity of goals within these groups has to be regarded, stated Prof. Kennedy. At the moment urban populations, especially in the US, communicate their values and attitudes towards forest management practices in several indirect ways. Urban populations have a larger influence on legislation, both formal as well as informal. They also represent a greater tax paying potential, so their attitudes have to be regarded by political decision makers. People living in urban areas also communicate values by donations to environmental NGOs, whom they expect to influence forest management practices either by on-site activities or by putting pressure on the political-administrative system.

Prof. Vos stated that there is not sufficient empirical knowledge about the actual goals of the different types of forest land owners. As an example, he mentioned a public discussion a few years ago in the Netherlands about a new forest policy which would have required 20% of Dutch forest land to be managed for nature conservation rather than other goals. When the new forest act was finally accepted in spite of protests from the timber industry lobby it turned out that, in reality, already about 28% of the forests were managed for nature conservation in the sense of the new forest policy. Rural as well as urban populations are already involved in some aspects of forest management; in others they are not. He assumed increasing the empirical evidence of the different

stakeholders' attitudes he assumed to be more important than concentrating on the definition of ideally polarised positions.

Prof. Glück pointed out the relevance of next day's field trip to the forest estate of the Monastery Klosterneuburg to this discussion, since the participants would be presented some examples of marketing non-timber forest goods and services in an urban area.

In a question directed to Prof. Kennedy, Prof. Koch stated the similarities with regard to structural changes in rural areas in Europe and in the US. The problems here in Europe might be caused by a lack of tradition in accepting the diversity of cultures or the sharing of power. He asked Prof. Kennedy which research needs he would be able to identify in this context.

Prof. Kennedy again identified foresters' attitudes toward change and diversity in general as one of the problems. The problem here, he mentioned, lies to a large part within the community of forest professionals who tend to chastise more liberal attitudes and views among their peers with scepticism and ridicule. If foresters would continue to use all their privileges, they might most likely loose them altogether.

In that regard, Prof. Solberg commented that maybe in the discussion, the importance of privileges might be overestimated. He noted foresters' willingness to change for the better, but it was the problem of being able to identify what this "better" might be, that resulted in uncertainty towards new demands. Even among the participants of this conference, uncertainty exists with regard to the actual demands of urban populations that are assumed to be the real clients of forestry. He stated that one reason for this uncertainty might be the fact that new demands are not actually being formulated strongly enough to be detectable as dominant. One possible explanation of this seemingly paradox situation might be the fact that overall, forestry is perhaps not doing so badly with regard to the attitudes of urban populations, for which other environmental questions might be of greater importance. Of course this would not exclude the need for changes, which have become evident in recent conflicts, such as the world-wide discussion on the relationship between forestry and biodiversity. He also identified the need for research in assessing the actual objectives of all the different groups of forest owners.

The positions of foresters, in general, and especially the role of forest services, who have lost a lot of their traditional privileges, were the subject of a question posed by Prof. Lust. He also wanted to know about the implications of these changes for forest education.

In his response, Prof. Kennedy explained that in the past, foresters had been responsible for the task of deciding about management goals as well as for the actual management activities. This role might change in so far as in the future, the decision about management goals might be more left to other stakeholders, in the case of public forest – the general public – while foresters might still be responsible for managing forests for these goals. The reason that the decision about management goals was left to foresters in the past might also be because in past times there was less interest in forests altogether. The increased interest in forests could also be seen as a sign that forestry has become an issue of importance for society at large. Consequently, the forestry profession might also be seen as more important now than it was in the past.

Prof. Vos added that while forests would always be of importance for societies, whether foresters would be so as well would depend on their actions and their willingness to adapt to new conditions.

With regard to the issue of forestry education, Prof. Solberg reported on a discussion in Sweden about an overall reform of the academic education system there. He cited that in this discussion, the forestry curriculum was mentioned as a positive example for integrating biological as well as technical and socio-economic subjects into a diverse and flexible education which was also seen as a desirable goal for other faculties. Thus, the prospects for adapting forestry education to new demands could be seen as positive, if the existing advantages were used.

Mr. Hackl brought up the issue of different philosophies in land use assignment, and asked the speakers about their opinion on either spatial segregation of land uses or integrated multiple use.

Prof. Kennedy stressed the harm that had been done by relying on the extremes of both of these strategies in the past. In his opinion, the responsibility for actual allocation of land uses should be left to the local level of management and decision making, which would have to adhere to broader goals, set at a strategic level. To realise this policy, responsibility would have to be handed over from central levels of bureaucracy to lower levels. Diversity might then result from the diversity of stakeholders' reactions to varying conditions in different locations.

In the continuation of this discussion in the afternoon, Prof. Pretzsch pointed to the fact that the current large scale privatisations in former communist countries in Europe might result in problematic ownership structures with regard to coordinating the various demands made by society. Compensation payments, for example, would work better with either larger ownership structures or new organisation forms of small-scale owners. He stressed the need for development of such organisational structures. Clear views on the requirements of such structures should have been developed prior to privatisation campaigns.



SESSION II

STIMULATING ONGOING COST RESEARCH

HOW CAN FARM FORESTRY CONTRIBUTE TO RURAL DEVELOPMENT?

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ABSTRACT

The specificities of rural Europe are moving towards closer relationships with urban areas; the public opinion is rediscovering trees and forests mainly for their amenity values; agriculture, forestry and tourism are more and more complementary; and new types of rural enterprises are appearing. This paper investigates the consequences of these evolutions from the point of view of the farm, and discusses which main conditions are to be fulfilled in order for forest farming to expand in these rural enterprises. Some considerations on the corresponding European policy are also made.

Key Words: Rural enterprise, farm forestry, regulations, European Union.

1. INTRODUCTION

Cultivated lands and woodlands now occupy 80% of the area of the European Union (12 countries) and only 20% of the population live there, of which a small part (less than 7%) works in agriculture or in silviculture. These figures are averages which hide important local disparities; they are also imprecise because the national data collection systems are not homogeneous which leads to difficulties in analysing their evolution in time and space. However, two general trends appear in France which are probably also valid at the European level:

- agricultural areas and “unused” areas (wastelands, heath, marshlands, rocks, dunes.....) are decreasing, unlike areas covered by urbanisation, industrialisation, transport infrastructures, etc.....
- there is an increasing part of the population which leaves the town to live in the country, and this is not only true for retirees. This demographic reversal is mainly motivated by the search for a good quality of life and is encouraged by the modern remote communication facilities and by the resettlement policy of industrial and services companies in small cities.

The result is that the distinction between rural and urban areas sometimes dim in all types of economic and cultural activities.

This slow evolution finds a partial and local remedy to the rural decline; does it allow us to serenely consider the use to be made of the coming arable land surplus? Within ten years, indeed, the agricultural land in excess will probably be above 16 million ha. and the number of farms, which is continuously decreasing almost everywhere in Europe, will be less than today, because more than 50% of farmers are above 55 years old, half of them have no successor, and the number of young people who set up as farmers does not compensate for the number of retirements.

Among the future uses of these agricultural lands, let us try to analyse the possible role of trees and forests in tomorrow's farms and the conditions under which they may bring a significant contribution to the latter's development. Further comments will then be given about the European policy in that matter.

2. FARM WOODLANDS AND RURAL EMPLOYMENT

31% of European area is occupied by forests, among which 18% are parts of farms, and more than a quarter of European farms contain woods. Forestry therefore seems to be an important component of many farming systems. It is, however, difficult to precisely describe the mutual relationships between agriculture and silviculture within the farms, because these two activities are generally analysed independently from each other.

In terms of rural employment, the importance of forestry is low when compared with agriculture: indeed, we consider in France that 1.000 ha of forest create 3 jobs, one before the harvest and two for felling and extraction, when 1.000 ha in agriculture create 40 jobs. This big difference is partly due to the fact that employment is much more subsidised in agriculture than in forestry by the government and the European Union. To these figures, 20 more jobs per 1.000 ha are to be added in downstream industries, both for agriculture and for forestry (there is indeed no significant difference on that matter between the two activities), but not all of these 20 jobs are located in rural areas. These figures easily show that a massive reconversion of arable land into closed forests would be disastrous in terms of employment, and that rural development can only be devised via a controlled expansion of forestry and its integration into the other rural activities.

A positive aspect of the forest and forest industries (FFI) sector should however be emphasised when speaking of employment. Because of lack of data, the following figures are unfortunately related to France only. In terms of total employment, the sector of wood production, logging and transformation is similar to the car industry or textile industry, and much larger than other industrial sectors (plastic, glass, leather, iron and steel.....). During the 1975-1990 period, the FFI sector suffered from a rather limited decrease of employment, in the same order of magnitude as the whole set of industries (the food and plastic industrial sectors are the only ones where employment has increased), and the situation of agriculture has been even worse. This confirms the opinion that forestry is able to play an increasing role in rural development, all the more because many forest services and non-wood goods break into new markets.

3. MULTI-ACTIVITY WITHIN FARMS AND MAIN CONDITIONS FOR FARM FORESTRY DEVELOPMENT

Everywhere in Europe we can observe a diversification of the activities carried on in farms. The agricultural activities themselves are diversifying (local products, medicinal plants, aquaculture.....) and increasingly carried out outside the farm to the benefit of the municipality or private persons. Moreover, various non-agricultural activities appear to satisfy towns' demand such as on-the-farm sale, renting of fields or buildings for various storing (materials, caravans, boats.....), reception of target social groups (schools, teenagers in rehabilitation, weekenders, tourists.....). If we also take into account the situations where some members of the family have part-time non-farming jobs, we see that an increasing number of new types of farms appear which may be named "rural enterprises". What are the conditions to be fulfilled in order that the forest activities can be a strong component of these new enterprises? At least three conditions seem to be deciding:

- Grant aids are obviously necessary because, except for some particular cases such as short cycle coppicing or populiculture, the profitability of forestry is too low to interest the farmers. Present afforestation grant schemes do already exist in each country but they are not well suited to the small size and the financial status of the small landowners. They consist of a short-term incentive period (15 years maximum in France) followed with a long period problematically financed by thinnings, which is itself followed by a very short harvesting phase weighed down by heavy uncertainties about marketability and prices. For the existing woodlands, the financial or fiscal systems should also be improved in order to facilitate the marketing of small quantities of products on local markets via the regrouping of supply and the establishment of contracts for a number of years with the buyers.
- The professional qualification of farmers and the stimulation of their unions should be reinforced. Farmers are generally underqualified in forestry and when they value their hedges and woods, it is often only in so far as reserve land or parts of scenery and family environment, whereas the tree represents for them a constraint (loss of arable land) or a simple farming tool (clamping of barbed wire, shade and fodder for cattle.....) or a low value domestic product (fuelwood, posts for fences.....), but are aware of the long technical itinerary which leads from the seed to the marketable product. The necessary improvement of their qualification does not only concern the silvicultural techniques, but also the use of tools and machines (they are dangerous and the potential use of agricultural equipment in forestry is limited), as well as the knowledge of markets and marketing procedures.
- It is necessary to maintain the system of rural enterprises dealing with wood transformation, in order that the prices paid to the producers not be handicapped by transportation costs. Proximity markets are necessary to absorb the small woodlots provided by rural enterprises and locally create an added value to the wood. Unfortunately, the present evolution of the sawmilling industry is in the opposite direction since the number of small sawmills is decreasing and some experts, who count themselves to the largest world-wide competitors, argue that a

good industrial unit should saw 40000 m³ per year of broad-leaved logs or 200000 m³ per year of coniferous logs (in France, we had 6803 sawmills in 1970 and only 3604 in 1992; and 92% of them process less than 8000 m³ per year).

4. WHICH ARE THE MOST PROMISING FOREST ACTIVITIES FOR FARMERS?

A detailed analysis of the regional features in Europe would be necessary to answer this question, and only broad perspectives can be given here. Three basic situations can be distinguished, depending on whether we consider existing woodlands, or natural afforestation, or afforestation of grazing and arable lands.

- a) Existing farm forests, which look like many other small private forests in that respect, are presently managed very weakly. The value of the products used for the farm's subsistence (fuelwood, small roundwood, picking products), when added to the value of the products, which are sold without receipt or other formality, is often larger than the income resulting from the sale of wood and the renting of hunting rights. There are, however, numerous cases where some intensification is possible by promoting the production of good quality timberwood. Special silvicultural and management rules are needed to stagger the replacement of overmature or low grade stands over time by plantation of small plots of high quality trees; several technical schemes are available, in some cases associated with grazing outside the regeneration areas.
- b) The case of fallow lands and grazing lands naturally afforested is more difficult. These stands are vulnerable to fire; they close the landscapes and they rarely contain high value species; their conversion into profitable forests by means of silviculture only is a long and problematical task. Their future is highly determined by the importance of grant aids which are given to breeding activities.
- c) Afforestation of agricultural land is a common policy highly recommended by authorities in the context of the reform of the Common Agricultural Policy, either in pure stands or in the various forms of agroforestry which associate trees, crops and cattle breeding on the same field. These afforestation schemes, however, seem to be adopted rather seldom by farmers to date (in France, only 15% of agricultural land afforested with public aid are performed by active farmers. What can explain their reluctance? Besides technical and financial reasons, they likely have psychological reservations linked to the fact that planting trees is irreversible, when the recent set-aside policy is often understood as a temporary decision open to amendments (this occurred recently indeed: the rotational set-aside rate for fields occupied with cereals, oleaginous and proteaginous crops was 15% in 1992 and is now 10%, and the fixed set-aside rate has also been decreased from 20% to 10%). The short (7 years) or very short (2 to 3 years) rotation plantations for energy or pulp purposes look more like agricultural than forestry productions

and thus seem to be more attractive to farmers, but their extension is still limited for different reasons, among which are some technical uncertainties concerning species, pathological risks, and long term durability of the system. However, the main drawback is the low market demand at the present state of fossil fuels prices. Their massive extension would also likely raise criticism from the public opinion due to their low biodiversity and their few scenic features.

In all cases where the main goal is the production of marketable timberwood, it is a matter of fact that the investments in labour and money that small owners can accept should aim at the production of quality timber, because low grade assortments can reach suitable profitability rates only if the quantities sold are significant. This is possible in large forest estates and is not the case with farm forests. But what is to be understood by the word quality? Whatever is the end use of the wood (solid wood, laminated wood or even chipped wood), it would seem that the market demand increasingly prefers the homogeneity of the quality, instead of the level of the quality, which would favour monospecific even-aged stands and not heterogeneous stands. However, an increasing part of the public opinion does not want that. Here there are some potential difficulties, which force careful reasoning about the biodiversity criteria to be incorporated in the management rules of the small farms' woodlands.

Beside the production of marketable goods, what can be said about the reasons which may incite farmers to turn partly into silviculturists? Governments and public opinion bring up many more arguments than the increase of income provided by wood production to convince farmers to plant trees. These numerous and well-founded arguments are about quality of environment, landscape beauty, biodiversity protection, water quality, erosion control, etc..... There is no reason to think that farmers are impervious to these arguments, but the decisions which they have to make require that precise answers be given to the very concrete questions they ask themselves such as: Which additional income shall I have in the coming years? Which compensation shall I receive in case of failure? Will it be possible to sell a forest as easily as a cultivated field or cows? Will it be possible to uproot prematurely the trees if it turns out that cultivation becomes more profitable? Which part of agricultural regulations and forestry regulations apply to agroforestry? It is often impossible to give clear answers to such questions because many rules which govern the multi-activity of rural enterprises are still not stabilised (for instance this is the case regarding the juridical, financial and fiscal mechanisms between tenant farmers and landowners), and the granting regimes are continuously evolving. Moreover, the wood market is free and thus much more sensitive to the overall economic situation than agricultural goods. And the huge problem of the payment of amenities provided to the society by private woods is still at the level of theoretical debates.

In such a situation, it is not surprising that many farmers adopt a cautious position. First they watch those who dare get involved into forestry or agroforestry, and when they plant some fields or meadows with trees, they do it initially on the less accessible or infertile soils. There is obviously an important need for many forms of demonstration projects and, of course, associated research projects in biosciences as well as in socio-economics.

5. THE ROLE OF AUTHORITIES

The contribution of farm forestry to rural development is highly governed by both national and European regulations which are the instruments of the forest policies of the individual countries and of the European Union.

But can we say that such forest policies do exist? At national levels, the answer should vary from one country to another. Concerning the European Union, let us remember that in contrast to agriculture, forests and wood products are outside of the field of Community policies because there is no juridical basis for a forest policy in the Rome Treaty, and forest matters are shared by at least eight DGs:

- I International Affairs, concerning some negotiations
- II Industry, for the wood chain
- V Concerning social funds, especially for forest training
- VI Agriculture: for forest strategy
- XI Environment
- XII Research: forest research is spread over several programs, especially FAIR, Environment and Climate, Biotechnology
- XIII Energy
- XVI Regional policies, mainly concerning regional planning actions

In that sense forest activities appear to be a set of rather scattered and one-off actions, often integrated in agricultural activities. The situation is similar for research which is managed by DG XII and other DGs, according to the appropriate disciplinary field.

However, the European Union has progressively strengthened its forest policy in successive waves (1989 and 1992), by trying to give a consistency to some texts based on different articles of the Rome Treaty. These measures are institutional (for instance creation in 1989 of the Standing Forestry Committee), financial (mainly via the structural funds, FEOGA, FEDER, FSE) and regulatory. They deal with:

- genetic quality of reproductive forest material (guideline 66/404/CEE)
- improvement of farm woodlands and afforestation of arable lands (regulations 797/85, 1604/89, 2328/91, 2080/92)
- forestry for regional development, especially the integrated Mediterranean program (regulations 269/79, 2088/85, 1610/89)
- forest protection against atmospheric pollution (3528/86, 1613/89, 2157/92) and fires (3529/86, 1614/89, 2158/92)
- valorisation and marketing of forest products (1611 and 1612/89, 866/90, 867/90)
- European system of information and communication in forestry

In total, we can consider that this set of regulations has been decided by reference to the other sector-related policies, mainly the Common Agricultural Policy (for instance regulation 2080/92 on afforestation of arable lands) and the Environment Policy (several regulations since 1978 about flora, fauna, protection against fires and atmospheric pollution). The result today is a complex abundance of regulations which are likely to change continuously, as and when required by the extension of the EU (the recent entry of three important forest countries as Finland, Sweden and Austria cannot be without consequences on forest policy). All this does not simplify decision making for the long

term, whereas rural development cannot be reoriented as quickly as industrial restructuring. The stakeholders lack future prospects, especially rural municipalities which is the level where land use decisions are made in practice. It is necessary to stabilise and make compatible the different regulations that a municipality must observe to organise its territory. To quote only one example, let us think of the recent European guideline 92/43/CEE (Natura 2000 network) concerning natural habitats which might concern 15% of the French territory and throw many forest systems into confusion, for instance populiculture.

6. CONCLUSION

This paper has raised more questions than it has given answers to problems concerning the role of farm forestry in rural development. Despite the difficulties which have been listed, we can be sure that the forest and forest industries sectors will play an increasing role in that development, and that some farmers can be decisive actors in that process. However, they need clear future prospects well adapted to regional particularisms. It is necessary that the different policies and in agriculture, forestry, industry, tourism, and environment be devised not only from the point of view of the corresponding sector, but also in the interest of rural enterprises considered in all their components as a whole, while taking care of the necessity to amend some regulations specific to agriculture in order to avoid their pursuance, for the non-agricultural activities of rural enterprises inflicts loss on the other existing enterprises (groceries, hotels, restaurants, forest enterprises.....).

As in every development issue, indeed, conflicts of interests are the rule, and they are solved all the better for anticipating and analysing the situations. Scientists are able to play a part in this process by weighing up the conception of research policies. There is, in particular, a great need for the rural enterprise, as a whole, and the set of its main partners to be taken more into account than today as a biotechnical and socio-economic research matter. It is perhaps useful to think – for instance within the COST framework – of the establishment of a carefully designed sample of rural enterprises where multidisciplinary research would be performed to better understand farmers' motivations, their successes and failures, in order to construct scenarios on the future of rural areas which would help to decide upon long term research programs on the development of rural Europe.

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POSSIBILITIES OF ADDITIONAL INCOME FROM ENVIRONMENTAL GOODS AND SERVICES PRODUCED BY AGRICULTURE AND FORESTRY IN MOUNTAINOUS AREAS

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ABSTRACT

The paper investigates if, how and under what conditions environmental goods and services constitute an opportunity for creating additional income for those working in agriculture and forestry in mountainous areas. The economic nature of these environmental goods and services is probed with reference to demand, supply and possible forms of remuneration. Policy tools to achieve remuneration are considered with reference to marketing opportunities in mountainous areas. Some evidence of additional income accruing to farming and forestry is given. A distinction is made between compensations and additional income provided by marketing of "non structured" and "structured" environmental services. The paper stresses discrepancies between those producing environmental goods and services and those receiving the benefit. Possible means to achieve compensation are therefore proposed.

1. THE ECONOMIC NATURE OF ENVIRONMENTAL GOODS AND SERVICES PROVIDED BY AGRICULTURE AND FORESTRY

What are now intended as environmental goods and services provided by agriculture and forestry, have traditionally been, to some extent, an input to agriculture and forestry aimed at conserving rural life and the productive base. Examples are the various stewardship work road maintenance, drainage and soil protection, shelterbelts and tree maintenance, fire prevention, etc. It was a sort of social consciousness, in addition to regulations, that convinced rural people, especially in the mountains, to carry out stew-

* This paper is part of the EU FAIR research: "Niche market for Recreational and Environmental Services" promoted by the following universities: Hamburg (U. Mantau, coord.), Padova (M. Merlo), Wien (W. Sekot), and the Institute for Forestry and Nature Research of Wageningen (H. Hekhuis).

ardship actions¹. Of course the final result was productivity and a better quality of life for both: individuals and the community.

Now, the picture (technology, productive relations, income) has completely changed. Only to a limited extent, do stewardship operations represent an input. Environmental goods and services are now mainly seen in terms of farming and forestry output. Economically, however, they are far from being well defined. Those who speak of ethical values connected to stewardship (Newby 1979, Colman 1994) basically still think in terms of input for agriculture and forestry. On the other hand, those who speak of environmental goods and services have a view of output which are closer both to current technology and the public's specific demands. What type of output environmental goods and services represent, and to what extent they are common to agriculture and forestry, depends on single situations and types of production.

1.1 Demand

In recent decades there has been a clear increase in the demand for environmental goods and services due to the strong positive relationship between environmental quality and income level (Beckerman 1992). This demand is highly dynamic, diversified and fragmented, as far as both user typologies and specific interests are concerned. Within a generation, attitudes have changed from indifference to convinced environmentalism, expressed by the so-called "green consumerism". With regard to the demand for environmental goods and services in the EU, one should first consider the 50% of the population living in rural areas (EC 1988). Only a small minority (around 10% of rural society) actually works in agriculture and forestry. Just a few decades ago, what is now a minority represented the majority. Then there is the demand from visitors, associated with the general growth in tourism. World tourism doubled over the decade 1983-93. A survey of 44 studies shows a rather high income elasticity of demand for tourism: a value of 1.8 is quoted by Crouch and Shaw (1990). As far as Europe is concerned, annual increases of 2-3% are expected, assuming that the supply is growing to meet new consumer needs. It has been calculated that in France, Italy and Spain on-farm tourism represents 2-4% of total tourism. Daily excursions to the countryside should also be taken into account. Environmental quality takes first place on the tourism demand agenda (Croize 1992). Apart from quiet and contact with nature, considered the main reasons for countryside tourism, little is known about visitors' behaviour (Blaine et al 1993). They appear to be rather differentiated: day visitors, weekenders, holiday-makers, and owners of second homes. Moreover, interests are varied, including birdwatching, hunting, landscape viewing and sport (Barbero et al. 1996). Thus there are contrasts among the various demands (Osti 1992). Besides agri-tourism as such, which is just a minor proportion of total tourism, it must be taken into account that much of the tourism and recreation in mountain areas is dependent upon the environmental goods and services provided by agriculture and forestry. Economic theory underlines their character as pub-

¹ Ethical factors (the heritage and survival of the local community, noblesse oblige of the landlord, the aesthetic taste for a well-kept landscape) went hand in hand with mandatory means (corvées of the villagers, internal rules of the village communities). To a large extent it was the Middle Ages "scholastic" conception of natural resources property rights (St. Thomas Aquinas) as *ius procurandi et dispensandi* rather than *ius utendi et abutendi*.

lic goods, and hence positive externalities. Total Economic Value (TEV) analysis of agriculture and forestry, which obviously goes beyond the classic distinction between public and private goods, points out use, option and non-use values (Table 1). A considerable number of valuations have been carried out in Europe (Table 2), using the Travel Cost (TC), Contingent Valuation (CV) and Hedonic Pricing (HP) methods. It has been shown that European consumers are willing to pay for environmental goods and services (Table 3).

Taking the distinction between the various types of value, it is possible to define the criteria for setting possible payments for producers of environmental goods and services. Clearly in cases where use values exist (for example recreation and tourism), and hence explicit consumer demand, it is easier to create a market – i.e. direct remunera-

Table 1. The Total Economic Value (TEV) of agriculture and forestry

Use value	direct indirect	e.g. e.g.	food and fibre recreation flood protection rural services
Option value	future use	e.g.	possible visit to a certain landscape or use of a certain species once the appropriate information becomes available
Non-use value	vicarious existence bequest	e.g. e.g. e.g.	pictures or videos of landscapes satisfaction from rural habitats conservation landscape enjoyed by future generations

Table 2. Number of environmental goods and services valuation in Europe

Type of environmental goods and services	Methods (n. of applications)			
	tcm	cv	hp	total
<u>Close connection to farming/forestry:</u>				
Forestry recreation	25	16	1	42
Agricultural landscape	-	2	2	4
Game hunting	-	4	-	4
Nature reserves & parks	9	25	-	34
<u>Weak relation to farming/forestry:</u>				
Water	10	21	1	32
Angling	11	7	-	18
Pollution prevention	-	3	-	3
Air quality	-	6	-	6
Noise prevention	-	2	7	9
Total	55	86	11	152

Sources: Navrud 1992; Dubgaard, et al. 1994

Table 3. Selected values of environmental goods and services

Country	Site & Function	Method	Value (ECU per capita)	Sources
Denmark	Mols Bjerge recreation	CV	3-6 day	Dubgaard 1994
Italy	Val Rosandra recreation	TCM	1	Della Puppa et al. 1994
Italy	Cansiglio recreation-conservation	TCM	4	Della Puppa et al. 1994
Spain	Pallas Sobirà recreation	CV	2	Riera 1994
Sweden	Agric. landscape recreation	CV	68 year	Drake 1992
U.K.	Yorkshire Dales recreation	CV	20	Willis et al 1991
U.K.	Windsor Forest footpath recreation	CV	7	Beard et al 1994

tion – following a “beneficiary pays” approach. However, when dealing with option and non-use values, it is clearly more difficult to adopt a market approach. Public intervention is essential, either through mandatory means or incentives aimed at guaranteeing supply – i.e., indirect remuneration following a “State pays” approach.

1.2 Supply ²

In mountainous areas there is a consolidated tradition of joint production between food/fibre and environmental goods/services³. A distinction has always been made, however, between production and functions⁴. Functions, known as “structural effects”, in a sense represent input⁵ (watershed management and protection, etc.) to traditional farming and forestry.

Modern technologies have given rise to productive processes in which the jointness between environmental goods/services and food/fibre has to some extent disappeared. There are cases in which the two are completely separated. The situation varies, however, according to the context and the production. The production possibility set (the isocost curve and the area below)⁶ can be outlined as in Figure 1 and Table 3.

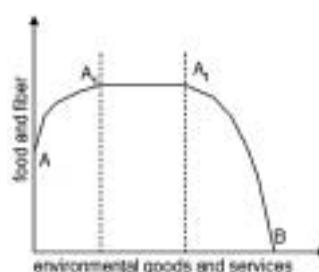
² The argument presented here reflects discussions that took place within the EU FAIR project: “Niche Market for Recreational and Environmental Services” at the Dpt.TESAF with the participation of R. Bettinazzi, L.Cesaro, P. Gatto, D. Pettenella, A. Povellato and P. Virgiliotti.

³ According to Bowes and Krutilla (1989, p. 50), “joint production means that some input is shared, having an effect on the production of more than one output”.

⁴ See the “wake theory” – Kielwassertheorie – formulated by the German forestry school in the 60’s.

⁵ The input character is shown by the following isocost curve where in the AA₁ segment food and fibre production increases jointly with environmental goods and services.

⁶ The production possibility set, as defined by economic literature (Bowes and Krutilla, 1989, p. 49) includes all input-output combinations for which $T(Q,X) \geq 0$. When $T(Q,X) = 0$, we have the “production function” representing the technically efficient frontier.



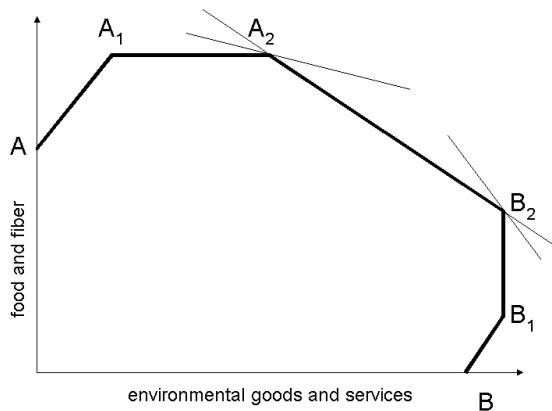
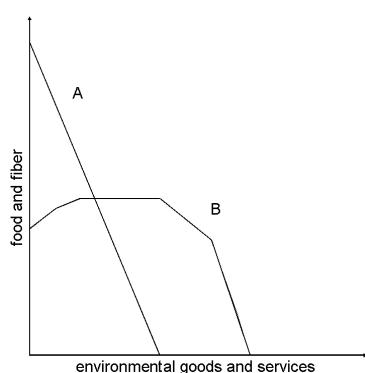


Figure 1. Production possibility set between food/fibre and environmental goods/services.

- (i) The first production possibility (AA_1) is entirely based on the production of food and fibre, which gains however (in terms of lower costs) when traditional stewardship practices are carried out, such as drainage, path maintenance, etc. Incidentally, stewardship here gives rise to environmental goods and services actually at negative marginal cost (maximum complementarity). Moving from A to A_1 , productive efficiency increases. It should be noted, however, that in modern productive processes, AA_1 tends to decrease; e.g., hedgerows are eliminated, field sizes are enlarged, and paths are reduced, etc. The final result is an overlapping of point A_1 on A on the ordinate, at a higher level of food and fibre production⁷. This is modern, fully industrialised farming/forestry technology, where nothing is left to tradition. This mode of production has not, however, expanded extensively in mountainous areas because of environmental constraints (slope, climate, etc.).
- (ii) The second production possibility is the A_1A_2 section where the production of environmental goods and services is still an incidental by-product, as is the case of agricultural landscape or biodiversity safeguarding, which do not involve any additional cost however. Environmental goods and services are perceived as externalities at nil value. The problem of paying for them is not posed. However, it is

⁷ The modern production possibility set is represented by the A curve and the more traditional one by the B curve.a



clear that in A_2 there is a greater production of environmental goods and services, and hence greater social efficiency.

- (iii) Moving beyond A_2 to B_2 environmental goods and services progressively take on the status of main products, which should be remunerated like food and fibre – this is the case of “hedgerows” maintenance with all the relative benefits, but also the costs. Stewardship (environmental goods and services production) takes place at the expense of food and fibre which decrease. The relationship between the two types of production may be complementary if the increase in production of the former is realised with a decrease in the marginal cost of the latter, or there may be substitution if there is an increase in the marginal cost of the latter⁸. In any case, A_2B_2 points out the technically efficient production possibilities given a certain provision of resources. However, it is the relationship between prices (or remuneration) of the output that leads to the economically optimal combination.
- (iv) Environmental goods and services have a technical limit in B_2 beyond which it is not possible to increase production or decrease marginal costs. Food and fibre represent by-products supplied at nil cost – as happens rather frequently in certain mountainous areas where crops have been abandoned and land is left neglected for natural reforestation or rough pastures. The transition from B_2 to B_1 , involving a loss in product (and technical inefficiency), is often due to institutional and social reasons.
- (v) Reducing production still further, from point B_1 to total abandonment of food and fibre at point B, some environmental goods and services may disappear, as they re-

Table 4. Productive possibilities of environmental goods and services joint to food and fibre in mountainous areas

Part of the curve	Economic nature of environmental goods and services	Jointness level	Type of environmental goods and services
A-A1	input or incidental by-product able to reduce marginal cost of food and fibre	maximum complement	drainage, road maintenance, erosion control
A1A2	incidental by-product with nil marginal cost for food and fibre	strong complement	landscape quality, biodiversity
A2B2	intentional by-product or main product while food/fibre becomes by-product	complement or substitution	hedgerows enhancing landscape and biodiversity, roads, picnic areas, paths
B2B1	main-product while food/fibre becomes incidental by-product	strong complement	agritourism
B1B	main/only product; food/fibre becomes incidental by-product (or input to environmental services)	maximum complement	wildlife services, parks, recreational areas

⁸ “Complements (or complementary products) are those output pairs for which an increase in the production of one leads to a reduction in the marginal cost of providing the other. Substitutes (or competitive products) are those output pairs for which an increase in the production of one results in higher marginal costs for the other. Independent outputs are those for which marginal costs are unrelated” (Bowes and Krutilla 1989, p. 57-58).

quire a minimum amount of agricultural and forest activity. Pointing out the nature of this possibility section, Bowes and Krutilla (1989 p. 72) report the case of wildlife service which benefits from a certain level of timber exploitation.

1.3 Decoupling remuneration of environmental goods and services from prices of food/fibre

The production possibility set joint to the isorevenue line (Figure 1) shows how, in the absence of remuneration for environmental goods and services, the productive equilibrium moves towards A_1A_2 . Whether A_1 or A_2 of environmental goods and services are produced is indifferent for the entrepreneur. However, considering that A_2 allows for higher production at no cost, and is hence the socially efficient solution, there is a rather common call for farmers and forest owners to adopt ethical behaviour. It should be pointed out, however, that just a minimum amount of remuneration for environmental goods and services may be sufficient to move the productive equilibrium to point A_2 , where a satisfactory level of production of environmental goods and services is guaranteed.

Increasing the price or the remuneration of environmental goods and services, the productive optimum moves along A_2B_2 where food/fibre and environmental goods/services are in competition. The relationship may be of complementarity or substitution. All the A_2B_2 solutions are technically efficient. However, high remuneration of environmental goods and services pushes towards B_2 , a point which should not be exceeded whenever food and fibre have a market price. Institutional or social reasons or extra-marginality of certain mountainous areas may jeopardise food and fibre production, moving the productive combination towards B_1 . Further decreases may annul food and fibre production, with negative effects on environmental goods and services as shown by B_1B . Inefficiency gives rise to the problem of guaranteeing adequate remuneration of food and fibre in order to ensure environmental goods and services.

Figure 1 in any case shows how production of environmental goods and services beyond AA_1 require explicit remuneration.

It can be remarked, however, that the price policies ante CAP reform, and even the compensation post CAP reform, supporting agriculture as such independently of environmental goods and services, seem to lead to productive combinations favouring food and fibre, jeopardising environmental goods and services. In the short term, equilibrium can be found in A_1 , while in the long run, high prices of food and fibre lead towards intensive, specialised technology, hampering joint production⁹. In short, the CAP, often justified because of agriculture and forestry's environmental purposes, has shown internal contradictions. What should have been safeguarded has been made disincentive. Moreover, non-joint intensive technologies have contributed to marginalisation of mountain forestry and agriculture which are necessarily based on jointness. Quite clearly, decoupling of food and fibre prices from environmental goods and services remuneration is necessary in order to achieve a multi-purpose agriculture and forestry.

⁹ It must be underlined that intensive agricultural practices, besides jeopardising environmental goods and services, can create environmental bads and dis-services. Amongst other things, it is not always clear what the boundary is between goods and bads. Fewer goods often means the creation of bads. For instance, non-fertilisation of mountain meadows safeguards biodiversity, and this is an environmental good or a positive externality. Heavy fertilisation, besides causing loss of biodiversity, creates nutrient releases (negative externalities).

2. POLICY TOOLS FOR ACHIEVING REMUNERATION OF ENVIRONMENTAL GOODS AND SERVICES

The supply of environmental goods and services may be guaranteed through different tools, mandatory or voluntary.

Mandatory tools are based on State intervention. They include constitutional principles, laws, regulations, plans, compulsory purchases, etc. Clearly, they reflect a regulatory approach to the use of natural resources. However, reference is often made to ethical and cultural values. Undoubtedly, these tools are indispensable for ensuring the supply of environmental goods and services. However, various shortcomings should be underlined. First of all, enforcement requires police measures which are rather difficult and costly to implement. Moreover, when applied to mountainous areas, compulsory measures may nullify income margins, encouraging land abandonment, a sort of tragedy of the commons (Hardin 1968).

Voluntary tools have been recently developed to achieve remuneration of environmental goods and services. They may be outlined as follows.

2.1 Financial instruments

At least since the beginning of this century payments have been employed in Europe to ensure land afforestation and watershed management, and more recently to promote amenities. A Pigouvian rationale is followed, aimed at internalising positive externalities provided by farmers/forest owners. They can take the form of: (i) **compensation** to make up for higher costs and/or lower revenues (e.g., damage to wildlife and game, conservation practices); (ii) **grants** and **incentives** to encourage farming and forestry practices which would otherwise be neglected; (iii) **tax concessions**.

It is sometimes difficult to pinpoint the exact nature of the various financial instruments, in particular the difference between compensation aimed at re-establishing the *status quo*, and grants/incentives/tax concessions aimed at encouraging otherwise neglected practices. An example is the 1992 CAP reform agri-environmental measures providing payments to farmers who undertake certain practices or forestry investments. It is clearly stated that these payments have to be proportional to any increase in costs or loss of income. However, their application according to a flat rate in each region inevitably gives some farmers/forest owners higher compensation than their foregone income. In other words their revenue for producing environmental goods contains a certain amount of producers' surplus (Whitby and Saunders 1994). Standard rates constitute the main shortcomings of financial instruments (Colman et al 1992, Bishop and Phillips 1993). They have also been criticised for undermining farmers' ethical commitment to stewardship (Colman 1994). Therefore an inherent risk in financial instruments is paying for something farmers/forest owners would do anyway, with lower payments or none at all. Existing literature, however, fails to make a distinction between the AA₁ segment of Figure 1, where financial instruments are not justified and A₁A₂, where a small amount is acceptable in order to make the system work.

2.2 Market-led measures

Market-led measures, widely discussed in recent years, advocate a Coasian rationale. In particular, they should overcome the objection, often made to financial instruments, of being indiscriminate and unethical. At least three market-led measures may be identified:

- (i) **management agreements** providing payments subject to negotiation between farmers and the responsible public authority. With respect to standard payments, they should avoid possible excess payments, resulting in farmers' rent. At least in theory the negotiation process should approximate the remuneration of environmental goods and services to the marginal cost incurred by the farmers, plus the profit necessary to stimulate the agreement.

Management agreements have been applied for some time in the UK (Bishop and Phillips 1993, Colman et al 1992) and the Netherlands (Slangen 1992). Various examples of "Vertragsnaturschutz" can be found in Austrian nature reserves. They are often applied in Italy, mainly within nature parks. High transaction costs seem to represent their major limitation (Whitby 1994)¹⁰.

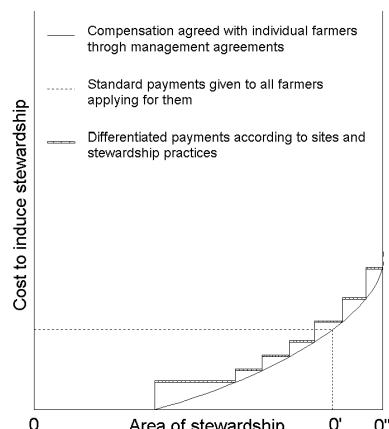
A compromise solution between the compensation agreed upon through individual management agreements and the standard payments given to all farmers applying for them is given by differentiated standard payments referred to sites and specific stewardship practices¹¹.

It has also been argued that initial assignment of environmental property rights to the community could improve the final results of management agreements. Bromley and Hodge (1990) emphasise that assigning what they call "countryside community attributes" to the public at large, rather than to land owners, could lead, in theory, to a better provision of countryside benefits as a consequence of the divergence between willingness to pay and willingness to accept payments. However, it can also be observed that assigning the rights to the public at large, would disadvantage farmers/forest owners and could lead to land abandonment, particularly in marginal mountainous areas.

A more extended view of management agreements, requiring contract registration, is given by the so-called "covenants" (servitudes praediorum). These are legally binding land management agreements. If permanent, they are attached to the

¹⁰ However it should be recalled that experience, wider applications and new technology could notably reduce the administrative costs as has been the case in the past with changes in property rights and regulations aimed to ensure traditional stewardship.

¹¹ Management agreements compensation versus standard payments. This figure tries to show how carefully differentiated and calibrated payments could induce stewardship in all O_{ij} area, avoiding excess payment as well as the high transaction cost of management agreements. This option has been chosen by several European countries and regions in applying the recent 1992 agri-environmental measures, part of the CAP reform.



land. From the community's point of view, they represent a stronger commitment and a guarantee of stewardship.

- (ii) **Marketing of environmental goods and services** (commoditisation), according to a pure Coasian approach, foresees specific markets where environmental goods and services can be sold directly to consumers. Unfortunately, the main premises required by Coase's theorem are often lacking. Definition and assignment of property rights is certainly the crucial issue¹². In this field, the different countries follow their own patterns. Access, hunting and fishing, mushroom and chestnut picking, etc., are treated in many countries as res nullius (free goods). In Austria for example, it could be easier to create a market for such goods as mushrooms, forest fruits and other minor products, as well as game and water resources since they belong to the landlord. In Italy, on the contrary, these goods belong to the State which can, however, delegate management rights to other public or private bodies. Again, in Finland, forest access for berry and mushroom picking is practically a constitutional right of every citizen.

In general, transaction costs make it difficult to market these benefits, regardless of whether such costs are met by public bodies or by the contracting parties. Therefore, the role of a pure Coasian approach must not be exaggerated (Bromley 1991, Zamagni 1994). However, the strong point remains the local nature of environmental goods and services whose supply and demand is relatively easy to manage, whether by individuals or by associations of producers and users making *ad hoc* agreements. This possibility has been widely applied in traditional stewardship (e.g., with reclamation and drainage consortia in which even non-farmers are associated). Extension to amenities does not seem impossible. This largely unexplored path could play a key role in defining environmental policies. Of course, practical solutions must be associated with local rights and customs, e.g., sale of access permits for recreation, sports and product picking; car parks, camping sites and farm accommodation; organisation of nature tracks, etc. To bypass the property rights issue, it has been suggested to adopt modern marketing strategies, the so-called products development in the framework of existing rights, as proposed by Mantau (1994) (Figure 2).

- (iii) **Marketing of traditional products whose image is joint to environmental quality.** This approach can be practised wherever direct sale of environmental goods and services is impossible or unwise. Remuneration can be achieved by selling traditional quality products, with the price being influenced by stewardship and, more generally, by the environment in which they are produced. Long established experience in this field should not be overlooked (e.g., with *appellation d'origine contrôlée* wines, cheeses and other products, agri-tourism, etc. activities allowing conservation of unique landscapes, land structures and rural culture). In the case of wine and cheese, regulations (aimed at consumer protection) were established, limiting the right to use the guaranteed origin label to local producers alone, provided certain procedures, sometimes including stewardship practices,

¹² Lack of definition and assignment generates market distortions, due to unclear rights (Demsetz 1967). Property rights are defined by laws, habits or agreements among the interested parties (Barzel 1989).

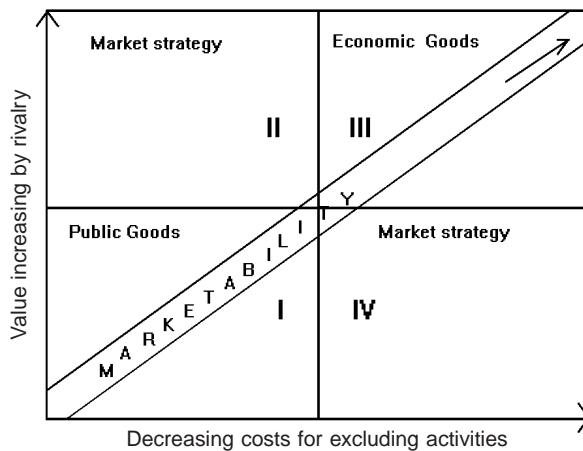


Figure 2. Continuous and dynamic structure of goods: The role of market strategy. Source: Mantau (1994)

are followed. Thus, the market rules have been modified (giving rise to differentiation and monopolistic competition in markets), allowing remuneration not only for the product quality, but also for the related agricultural practices and the environment. These policies which originated in Latin countries are now proposed by the EU for many other products of controlled origin and quality and, in particular, for organic products. See, for instance, EU Reg. 2092/91 on organic farming and Regs. 2081 and 2082/92 on origin and specificity labels. It is interesting to note that on March 6 of this year the EU approved the IGP/DOP concerning Italian mountain products like the Montella chestnut, Borgotaro mushroom and Piedmont hazelnut. An important role will also be played by the policy of eco-labels (EU Reg. 880/92) and stewardship certification (Forest Stewardship Council 1995) now proposed for many products which, in the case of agriculture and forestry, should certify the countryside benefits associated with agri-forestry production e.g., timber produced through sustainable forestry. Given the growth of "green consumerism", European consumers' sophistication and willingness to pay, these policies seem to have a future and therefore an impact on the conservation of rural amenities.

2.3 Trusts, persuasion and cross compliance

Trusts for conservation, amenity and recreation have recently assumed an important role in promoting environmental goods and services. Purchase of land is considered where important countryside features have to be protected and enhanced. In other cases, leases, management and acquisitions of specific rights have been used. These non governmental organisations are playing the role once assigned to public bodies. Quite interestingly, the flexibility of these trusts, together with the size of the concerned es-

tates, seems to favour marketing of environmental goods, therefore allowing direct remuneration.

Measures of **persuasion**, through **information, advice** and **extension services**, have also been developed to facilitate the implementation of the various tools examined so far. Generally, this task has been assigned to the administrations responsible for enforcement e.g. Forest Services. In some cases non-governmental public bodies have been employed (e.g., the Countryside Commission in the UK). Thanks to modern mass-media, persuasion has become more effective in modifying farmers/forest owners' behaviour. An equally important role is played by general public information. Demand for environmental goods and services and behaviour in the market are therefore influenced. Where persuasion does not work, **cross compliance**, i.e. respect for countryside stewardship as a condition for gaining access to other support schemes, has emerged as a powerful instrument to induce stewardship, therefore "coercing" farmers/foresters. Elements of the cross compliance approach were included in the 1992 CAP reform which allows higher rates of compensation, providing certain environmental standards are met (e.g., as regards livestock density). Enlargement of such measures has been proposed for the "all compensation scheme" of the CAP reform (EC 1994).

3. CASES OF MARKETING ENVIRONMENTAL GOODS AND SERVICES

The following Table 5 attempts to classify several, mainly Italian, cases of environmental goods and services marketing. The table is very tentative, while the conceptual framework does not always fit individual cases; some situations overlap.

The above examples concern, first of all, "**non-structured**" environmental goods and services, i.e., those intrinsic to forestry and the countryside like access, hunting and fishing, watershed management and water treatment, the image of rural landscapes.

Then there are "**structured**" goods and services in which some entrepreneurial entity develops and supplies additional products that are, in any case, connected with forestry and agriculture and are the result of a specific managerial decision: footpaths for visitors, car parks and picnic sites, recreational and nature centres, educational and sports facilities, etc. In other words, the complementarity between environmental quality and services provided by agriculture and forestry is exploited through market transactions. This type of market has the inherent advantage of not modifying existing property rights. Above all, it is based on marketing strategies.

The last case of remuneration is that of **traditional** forest and agricultural products whose image have a market value linked to origin and quality. Environmental services may thus be remunerated through traditional products. Of course, assignment of origin label rights must be carried out within new market strategies. Adoption of these strategies often requires establishment of producers' associations, collective agreements and common marketing policy. As already mentioned, these cases now involve many mountain quality products (cheese, milk, fruits, various processed berries, organic farming, etc.). Applications are now also being extended to timber, mushrooms, herbs and other forest products, as considered in recent years by the above-mentioned EU regulations.

Table 5. Marketing of environmental goods and/or services provided by agriculture and forestry in mountainous areas

	Goods and/or services	Conditions for markets' creation	Payment vehicles *
1. Environmental goods and services (non structured)			
DIRECT REMUNERATION	Picking mushrooms, truffles and other non-timber forest products	Property rights definition and assignment	access card, tickets, etc.
	hunting and fishing	Property rights definition and assignment	** access cards, consumption invoices, etc.
	access (trekking, skiing, birdwatching, climbing)	Property rights definition and assignment	** access cards, subscriptions, concessions, etc.
	water regime and treatment	Property rights definition and assignment	Management agreement consortia, subscriptions, etc.
	landscape images	Property rights definition and assignment	advertising property rights
2. Additional/complementary services with respect to environmental goods and services (structured)			
INDIRECT REMUNERATION	picnic sites, service structures, etc.	licence and permits	** access cards, tickets, subscriptions, etc.
	footpaths for various purposes, etc	licence and permits	** access cards, tickets, subscriptions, etc.
	car parks, caravan site	licence and permits	tickets
	tourism and educational centres, laboratories and museum	licence and permits	tickets, subscriptions, etc.
	sport centres and recreation facilities	licence and permits	access cards, tickets, subscriptions, etc.
	hire of sports equipment, riding facilities, stables	licence	access cards, tickets, subscriptions, etc.
	farmhouse accommodation, meals and beds	licence and permits	consumption invoices
3. Traditional quality products linked to the area and production techniques			
	traditional quality products linked to environmental quality	Property rights definition / assignment, labels and trade marks	** consumption invoices
	traditional quality products linked to environmentally friendly techniques	Property rights definition / assignment, labels and trade marks	** consumption invoices

* Intermediary figures may exist between the land owner and the consumer (various levels of managers, tenants and concessionaires) responsible for marketing environmental products and services.

** Cases in which collective agreements between supply and demand organised in associations or consortia may facilitate the creation of a market.

4. SOME EVIDENCE OF ADDITIONAL INCOME FROM ENVIRONMENTAL GOODS AND SERVICES

In order to quantify the additional income to agriculture and forestry due to environmental goods and services, the following components should be underlined¹³, although they are not always shown in existing farm forestry accounting:

- (i) compensation/grants paid by the public sector (financial instruments and management agreements);
- (ii) marketing of “non structured” environmental goods and services;
- (iii) marketing of “structured” environmental goods and services and
- (iv) food/fibre whose image is linked to environment quality.

4.1 Additional income linked to financial instruments and management agreements

These are incomes corresponding, for instance, to the aids foreseen by Regs 2078/80 and 797/85 on Environmentally Sensitive Areas (ESA art. 19) or various other measures, national or local, applied in nature parks and reserves. The contribution to farm income remains, however, rather limited and should not exceed at most 10% of total income. Incidentally, it has been calculated, with reference to the 1980s, that explicit subsidies amounted to a maximum of 6-7% of the gross product, with an EC average of 4% (Bartola and Sotte 1992). It is, however, possible that enterprises located in mountainous areas may benefit from slightly higher percentages. In general, income from explicit remuneration of environmental goods and services has remained much lower than “additional income”, if this term can be used, due to agricultural price support policy. This situation may, however, rapidly change, given CAP adaptation to world market prices. It is also possible, as advocated by several sources (EU 1994), that market compensation foreseen by CAP reform may be conditional on provision of environmental goods and services following the cross compliance principle. A rather meaningful example of ongoing developments is given by CAP reform accompanying measures expenditure (Reg. 2078 and 2080/92) which is gradually taking on a more relevant weight in the EAFOG (guarantee section).

Year	1993	1994	1995	1996
%	0,6	1,5	2,4	5,5

Source: CE (1995, p. 217)

¹³ It should be observed that the RICA (or FADN) accounting networks have only in recent years paid attention to this additional income, making a distinction between food and fibre revenues. Compensation and grants paid by the public sector are however accounted in traditional accounting, as is income from products whose quality/image is linked to the environment. This does not apply to structured and non structured goods and services, almost always neglected. A reason could be that farms marketing environmental goods and services are not included in RICA/FADN samples, as they are not ordinary cases.

4.2 Additional income linked to “non structured” environmental goods and services

Marketing of non-structured environmental goods and services, as outlined in Table 5, clearly remains rather limited and largely hypothetical in terms of additional income to farmers and forest owners. Even where real market transactions take place, agriculture and forestry as commonly understood, in particular small medium-sized enterprises, appear to be by-passed. One must think of hunting, fishing and mushrooms rights that, in various countries, constitute income for local or central public bodies and not for farmers and forest owners. At most, additional income accrues only to very large estates (which are rather rare in much of Europe), above all Common or Public Properties, the only ones having the size and know-how to manage and market “non structured” environmental goods and services. Almost absent are associations and consortia among small medium-sized enterprises, which are essential for marketing environmental goods and services produced on a scale beyond that of individual farms and local administrations. In addition, creation of additional income from “non structured” environmental goods and services, requires significant changes in existing property rights, not always politically palatable. It is therefore difficult to envisage real opportunities for additional income to farmers and forest owners from non-structured environmental goods and services.

4.3 Additional income linked to “structured” environmental goods and services and marketing of food and fibre whose quality/image is linked to the environment

Structured environmental services represent, undoubtedly, the more interesting and promising development in terms of new additional income for farmers and forest owners. As shown by Table 5, cases are numerous and rapidly expanding. What is more important, farming and forestry are directly concerned, including small-medium size enterprises, particularly those located in mountainous areas. The most common cases are the various forms of farmhouse accommodation, sports, especially riding facilities, car parks and caravan sites.

The number of European farms involved approximately 100-200.000 cases. Specific statistics are not available however. Table 6 tries to give an outline of the situation, with reference to various sources in selected European countries. Austria is the country most concerned, with almost 10% of its farms, above all those located in mountainous areas, where sales of environmental goods and services are more common and consumers are more interested.

According to the Italian figures, **agri-tourism income** is estimated at 300 billion lire, around **30 million lire per farm – 10.000-15.000 ECU**. This is a rather remarkable figure, which however only concerns 10.000 farms, most of which are located in two areas, firstly the Tuscany and Umbria, and secondly Trentino – South Tyrol. Services offered mainly consist of meals and accommodation, riding and other sports facilities, apartments, camping and caravan sites (Palmieri 1995, Barbero 1996 and Il Sole 24 ore, 24/2/1996).

Table 6. Agri-tourism supply from selected European countries

Countries	Farms	% of total farm	Beds	Nights
Austria (1991)	28,000	8.0	300,000	...
Finland (1982)	2,000	1.0
	4,000 *		...	630,000
France (1990)	20,000	2.0	...	10,000,000
Germany (1991)	23,000	3.0
Ireland (1982)	500	0.2
Italy (1990)	7,000	0.4	100,000	8,000,000
Spain (1980)	8,000	0.4	32,000	7,000,000
UK (1990)	10,000 **	4.0
	10,000 ***			

* ((farmer-owned cottages)

** (farm accommod.)

*** (catering accommod.)

Though it has grown considerably in the past 20 years, agri-tourism is still the exception rather than the rule. A rather positive aspect, however, is its location in mountainous and hilly areas. What is a disadvantage for traditional agricultural and forest productions becomes a competitive advantage for the new environmentally-oriented activities. Incidentally, 5,000 farms are waiting for permits to practice agri-tourism, and this is a clear indication of its growth.

It is noticeable that rural tourism, as intended by the EU, is a much wider notion (as shown by Com. (88) 501 def. 29 July 1988) including "not only on-farm tourism but all tourism activities carried out in rural areas". Non-farm rural tourism, hotels and restaurants excluded, involves another 5,000 units in Italy, with an average income of around 20,000 ECU (Palmieri 1995 e Il Sole 24 ore, 24/2/1996).

Much greater is the income accruing to traditional tourist industries linked to mountain resorts (skiing, hiking, etc.) The turnover is very high, as is well known. What is less well known is the essential role played by agriculture and forestry, which however do not receive remuneration. Table 5 also shows how the sale of "structured" environmental goods and services provided by agriculture and forestry often by-pass these activities, the income being enjoyed by different subjects who organise the supply and marketing of such services.

The problem arises of how to involve farming and forestry in this organisation and the relative revenue. **Co-operation and associations** appear to be essential, as these activities need large spaces, involving multiple property units. This may be the case for footpaths, cycle paths and even more, nature-oriented management of recreational areas. Quite clearly, scale economies, and the need for co-operation and association amongst farmers/forest owners, already felt in terms of traditional activities, is even more badly needed for the new environment recreation-based activities.

Consumers, who also need organisations (amenity societies, mushroom pickers, bird-watchers, etc.), are equally looking for a counterpart able to provide environmental goods and services. Obviously the management of such environmental goods and services may be a different subject for the farmer or forest owner. Incidentally, this is the

case with many other farm services, processing and marketing of traditional farm/forest products. In other words, it is not always either necessary, or advisable that farmers and forest owners become the marketing managers of environmental goods and services. It is important that they organise the supply in order to receive remuneration for such goods and services.

Finally, there are many examples of additional income due to quality products which have their image linked to the area of production and its environment. Farm accounts clearly show income which would not be otherwise achieved. This case often involves mountainous areas specialised in high quality products, incl. traditional cheese, fruit, wine, secondary specialities and relative processing. The income of these farmers is often higher than their counterparts on the plains involved with more traditional commodities. Incidentally, virtuous circles are stimulated involving not only farming, forestry and processing, but also tourism and the overall rural local economy. Examples of these agri-tourist districts concern a variety of products that go well beyond traditional agricultural and forest products, to involve liqueurs, ham and other processed food and drinks (Agritourist 1993).

5. DISCREPANCIES AMONGST ENVIRONMENTAL GOODS AND SERVICES PRODUCERS AND BENEFICIARIES: POSSIBLE COMPENSATION AND REDISTRIBUTION

Figure 3 shows how the **costs of producing environmental goods and services** are born by farmers and forest owners, while the benefits are mainly received free of charge by consumers or by intermediary activities, particularly the **tourist industry**.

The problem outlined in Figure 3 is certainly not new. The answer often given is that the taxes paid by tourists, the tourist industry and society in general should allow **redistribution** through compensation and aid given to agriculture and forestry. In particular, it is often remarked that in recent decades the CAP has drained three quarters of the EU's financial resources. This now also includes compensation and incentives specifically aimed at improving the supply of environmental goods and services provided by agriculture and forestry.

This view, certainly reasonable, leaves space for criticism however. Improvements are possible and advisable and to some extent have been incorporated in the 1992 CAP reform. The following observations can be made:

- (i) The idea that the producers of environmental goods and services should be remunerated through redistribution gives rise to a system that is not always transparent, allowing for discrimination, as shown by the documents preparing the CAP reform (a well-known argument is that 80% of the EU's CAP expenditures have given benefits to only 20% of the farmers who, generally speaking, are not those located in mountainous areas).
- (ii) In any case, redistribution involves high transaction administrative costs, both for collecting taxes and for distribution of compensation/grants/incentives to agriculture and forestry incidentally the shortcomings of this policy have been shown by previous sections of the paper.

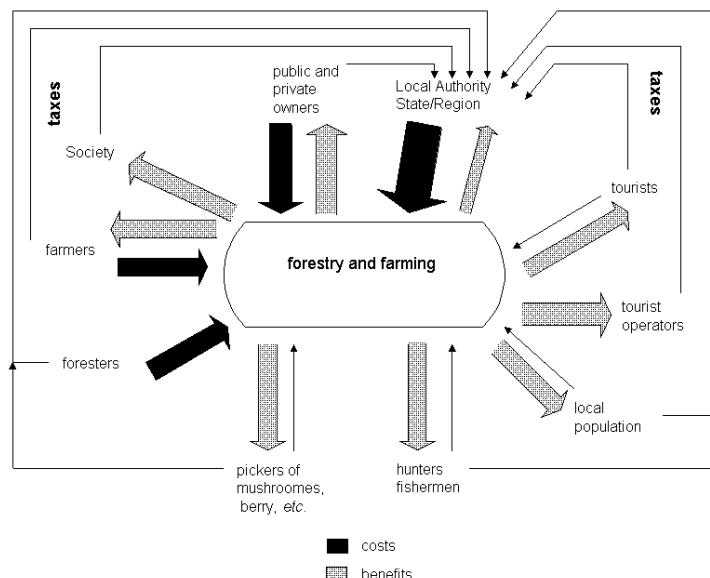


Figure 3. Cost and benefits of farming and forestry in mountainous areas

- (iii) In any case, redistribution, as undertaken to date by the EU through the CAP, has mainly given benefits to agriculture, rather than mountain agriculture which are the activities widely believed more concerned with the production of environmental goods and services.

These observations point out the importance of policy tools based on Coase theory. It has been also remarked, however, that market remuneration of environmental goods and services is not always either possible or advisable. The real world is made up of institutional and social constraints, while environmental goods and services have a TEV which is not always appreciated in the market.

Some activity towards creating a market for certain environmental goods and services is, however, feasible and possible, as shown by Table 4. Collective agreements (co-operatives, associations, etc.) amongst producers of environmental goods and services often represent the first most difficult step; management and marketing constitute the following necessary steps.

This process has been followed by Common Forest Properties in the Italian Alps which represent a rather successful example of marketing of environmental goods and services. Their institutional framework between the private and public sector is remarkable, while the local community seems to constitute the best arena for realising compensation among the various subjects involved in producing and marketing environmental goods and services. Incidentally, the "optimality" (i.e. the ability to maximise the utilities of individual partners) of these Alpine Common Properties was underlined more than a hundred years ago by Pareto himself¹⁴. Two cases are highlighted in the footnotes¹⁵.

Of course, marketing alone does not represent the panacea either for the provision of environmental goods and services, or for creating additional income for farmers and forest owners. Ample room remains for application of management agreements, financial instruments and mandatory tools whenever certain use values, and even more option and existence values are concerned.

The real world's complexity must be met by a multiplicity of policy tools.

¹⁴ Referring to Alpine Commons, Pareto (1896) affirmed that "since it has undergone the trial of free competition for centuries, collective land tenure respond better [than other forms of land tenure] to certain specific needs.... Its violent destruction would mean a loss in the Nation's total utilities".

¹⁵ Case 1: Marketing of access permits for mushroom picking and recreation in common properties owned by local families

The Comunalie Parmensi (Appenine Mountains, Northern Italy), own 9,000 hectares of forest, pastures and non-productive land. Over some 4.000 hectares of coppice, mushroom-picking has always been very important for local people (the members of the Comunalie that own and collectively manage the land). In recent decades, access for mushroom-picking by visitors has started serious competition over the resource. At first restriction seemed difficult given consolidated free access. A valuation of this access, in the mid 1980s, gave a value of around 2 ECU for a daily visit, using both Travel Cost (TC) and Willingness to Pay (WTP) Contingent Valuation (CV).

After some legal debate, the Comunalie Parmensi have been able, in 1988, to establish mushroom-picking reserves where the access was limited to the local professional pickers with specific licences. However, access permits also began to be sold to visitors at around 2 ECU per day (the same rate as WTP ascertained through TC and CV). Control was undertaken by the professional pickers in addition to the forest wardens of the Comunalie. Some 7.000 daily tickets were sold in 1988, increasing to 10.000 in following years. The price of the access ticket was increased to 9 ECU in 1993, but visitor numbers did not decrease. Now the revenues from mushroom-picking permits, amount to some 20 ECU/ha/year, accounting for 50% of the totalComunalie revenue. The balance is made up by revenue from timber and medicinal herbs.

Case 2: Marketing of access rights for skiing in common properties owned by local families

Cortina Regole in the Eastern Alps (Northern Italy), owns some 16.000 hectares of forests and pastures collectively managed. Until 30 years ago almost the sole revenue was from timber (spruce and pine). Now the main revenue (around 50%) is from rights paid for skiing concessions, buildings rented for tourism activities, excursion services, etc. The total revenue is around 40 ECU/ha/year. It must be noted, however, that access rights are not paid directly by the visitors to the Regole's Common Property, but to the companies that manage ski-lifts and other services. These companies work on the basis of 20 to 30 year concessions from the Regole.

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DISCUSSION 2

Monday, 3:00 - 3:30 PM

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SUMMARY OF THE DISCUSSION

The discussion focused on questions of ownership structure and the development of markets or other instruments of transaction for meeting new demands made by society. The role of forests was shown to be closely related to the overall tradition of policies directed at rural areas in the different countries.

As a response to a question by Prof. Kennedy, Prof. Merlo described the practice of decision making according to the example of common ownership forests in Italy which he presented in his paper. Forestry issues there are discussed by all the villagers in the same way as other issues of common interest, like tourism or traffic for example. The value of this practice lies in getting perceptions of different view points for a variety of subjects.

Prof. Merlo was then questioned about his opinion on the relationship between marketing new goods and services and the need to ensure overall forest sustainability.

Using the example of Italians travelling in large numbers to Austrian forests for mushroom picking, Prof. Merlo admitted the need for setting up quantitative limits for certain activities. He compared this to the practice of the city of Venice, where a numerus clausus exists for tourists admitted entrance to the city for the purpose of protecting the historical assets of the city. In the sale of a limited number of licenses for mushroom-picking, however, he sees a chance for forest owners to gain income from these activities, even within the constraints of sustainability requirements. He also mentioned positive effects, which might arise from farm forestry activities, where the sale of farm products together with the arrangement of guided tours for tourists could prove a beneficial form of income.

Prof. Koch referred to the topic of water supply that was raised during the press conference earlier in the day. He asked the participants of the conference if they were able to comment on possible research topics here, especially regarding appropriate political means to ensure water supply in the future.

An example from France was mentioned by Mr. Cailliez. French water supply companies pay subsidies to farmers if these adhere to certain practices which should ensure water quality in the catchment areas of the companies. These companies will also buy the farmland in question, should the farmers wish to abandon management of these areas. Although this example refers mainly to agricultural land use and the problem of pesticides and fertilisers, it might serve as an example for a possible solution.

Prof. Merlo categorised water supply as a non-structured resource, stating that it could neither be defined as public nor private. He reported about Italy, where hydro-electric companies pay compensations to the communities for the use of water for energy production.

Dr. Axelsson-Lindgren mentioned the good organisation of farm forestry in Sweden, which provided a good basis for implementing new land use policies there. She also referred to the example of tourism research, where there is a large field of research regarding the marketing of individual destinations. This experience, she concluded, could also be of interest for the topics raised during the conference.

Prof. Solberg then brought up the question as to which factors the participants would consider necessary to be regarded in forestry, in order for forestry to be a valuable contribution to rural development.

Mr. Cailliez stressed the importance of providing more support for smaller forest estates. Currently, time and money is spent in research and practice for achieving an increase, both qualitative and quantitative, in timber production on small patches of land. But on the industrial side, still more concentration processes could be observed. This development would lead to a further shift in market power away from land owners towards the industry, together with a rise in transportation costs. This would lead to a further decrease in timber prices, considering the fact that the timber market, unlike agriculture, is a market free of interventions. A further decrease in timber prices though, might thus result in a collapse of timber production in Europe, if timber harvest proves no longer profitable for land owners, with possible negative effects for the provision of other goods and services as well.

In a reaction to these comments, Prof. Glück asked Prof. Merlo to report on his FAIR project on niche markets. Prof. Merlo did so, stressing the main research issues. The problems of property rights and appropriate transaction procedures for providing recreational and environmental services were the main focus of interest in that project, where he worked together with colleagues from Austria, Germany and the Netherlands.

HOW CAN WE MAINTAIN HEALTHY MOUNTAINOUS FORESTS?

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Fact

There is only one close-to-nature silviculture, but it is accented differently depending on site-specific and historical conditions.

1. GENERAL OPINION

The eco-niche of mountains in a landscape plays an enormously important role in the life of the mountain landscape.

*It is not a respected fact that forest and water are an indivisible unit.
Interrelationships exist between functions in the landscape.*

The protection functions of forests are misunderstood. In fact: mens sana in corpore sano means “healthy forest in a healthy landscape.”

It gives cause for serious concern that mountains in general are heavily spoiled. The disturbances in the Alps are a special case due to western civilisation (permanent pressure from multiple sources). To explain this fact we need a broader approach. Mountains in a landscape play an important function created through the history of the earth. Countries with mountains can be happy to possess these geographical entities. Heavy stress disturbs this function. The lowland conquest deforested the country several times removing all the bio-substance – the most important part of this mountain life. This happened through the disturbance of water regime and is the beginning of the end. Erosion is the result, and the question which arises is how nature tries to solve the problems of life on slopes (gravity)? The retention capacity of ecosystems on the slopes must be slope-specific, and the secrets are hidden within the structure of the forest bio-substance. The question which arises is how living substance turned the gravity problem to its benefit – the permanent experiment of re-orienting the flow of energy and bio-sub-

stance in an upslope direction. Man has certainly never fundamentally studied these questions. Therefore, the results are negative. Classic disturbances (grazing, large scale clear-cuts, air pollution, etc.) contribute heavily to this inefficiency of this patent of nature. In Slovenia, therefore, the clear-cut was forbidden in 1948, in Switzerland in 1902.

Man has not yet considered the second law of thermodynamics which clarifies the problem mentioned. The mountain, in a given landscape, was heavily disturbed in the functioning of its eco-niche. We can state the equation: mens sana in corpore sano, which, regarding the forest, means: "healthy forest in a healthy landscape."

The misused mountain forest.

A clear-cut is a monster producing freak forests.

When respecting the previous considerations, we can easily understand why the clear-cut system is the monster of the mountain landscape economy. In the nature of life, a clear-cut is, in general, not its patent, but a chaotic disturbance. This is totally opposed to the permanent intentions of nature to diminish the amount of entropy. Of course, we find chaotic incidents in untouched forests that resemble clear-cuts. But, ecologically, these are not disturbances like man's clear-cuts because everything stays on the very place. Nature immediately starts to cover the spots with new life, for example pioneers, etc. The clear-cut and similar activities are therefore producers of a crippled landscape. A crippled landscape is an unhealthy environment for life in its totality. To get a healthier mountain landscape and healthier forests on mountains, we must recognise this fact. If we are not able to see this fact, then our management cannot be successful. We need to give up such extensive treatment.

The forester's respect for native and site-appropriate local species is not regularly accepted in today's mountain economy.

The Alps are simultaneously experiencing abandonment and over-use, both leading to desolation.

Responsible forest management and world-wide trends for homogenisation are in constant conflict.

Close-to-nature forestry knows and respects the law of the site. Sites are the translators of permanently new appearing individuals. Translation means the creation of natural local populations which fit to the given site conditions. The mountain site conditions are extraordinarily site specific. To protect life, the selection process must be very severe, ensuring that individuals adapted to such conditions can stay alive through all the extremes they will encounter. The individuum and its natural population in a mountain forest ecosystem are very well "organised" in ways to carefully household energy, and with respect to the mastering of the second law of thermodynamics; the problem of slope gravity. Therefore, it is not appropriate to introduce lowland races to (foreign) mountain sites. Too often, this fundamental premise is not observed when managing the mountain economy. The man from the lowland country, in his aggressiveness, continually tries to influence the lives of the mountain populations. He heavily disturbs them,

causing accidents. The spirit and behaviour of the lowland man is, in fact, inappropriate for the mountain populations. He did not leave anything in the mountain area except when bringing some tourist pocket money to the highland. Considering this, we slowly understand how problematical the shift in the populations most affecting mountain forests are: the downslope migration of mountain-adapted people as they abandon their agricultural way of life, and the upslope movement of the town people with their habits which are completely foreign to nature. This opposing movement is really quite dangerous. The mountain people have, in fact, a nature-preserving talent. The towns people are children of the entropy, thinking they can dictate how to manage the mountains. Considering this fact, we slowly understand how difficult the fight of close-to-nature forestry is against the dangerous homogenisation and nature devastation due to the aggressiveness of towns people within the pre-programmed suicidal character of mankind.

The philosophy and technologies imported from the lowland are destructive to the mountain landscape. In contrast, the character of mountain life, because of its conservative, and therefore, entropy-safe style can efficiently contribute to an ecologically healthy life. Dangerous trends mentioned before are becoming more and more general. The negative and damage causing influences from the lowland – “read” smaller but more fertile areas – on the prevailing less fertile areas, became the rule. The comparative riches reaped from the lowland, lead the lowlander to try to influence poor, less developed areas in an inappropriate way. This trend can also be observed when the white man’s civilisation inappropriately influences other parts of the world, for example the tropics.

Some crucial characteristics of mountain forests and their landscape.

Mountain forests have extreme site conditions which vary over short distances.

Small sized high-diversity mountain forests versus butcher mentality in forestry (clear-cuts).

Harsh climate, differences in parent material, strong influences of precipitation on the destruction of rocks and local specific appearance of never-ripe soils, influence the richly structured forms of the surface. This surface is a very important creator of localised site conditions. These site conditions, in turn, are the creator of different locally dependent natural populations, or their partly developed natural populations. Man has investigated the natural population of spruce in Pokljuka (a not too highly configured mountain pan – concave landform) in the Julian Alps. This study showed how different the spruce can be shaped depending on the local surface conditions. We find the smallest crowns on the lowest places of the concave; the largest ones are found in the highest elevations. The types between both extremes are dispersed according to other surface specifications. We found the diversity at a rather high level despite the fact that this is a spruce monoculture, although a natural one. Considering these facts, we slowly understood the fatal spirit of the butcher’s mentality in forestry as a product of short-term profit thinking and lack of new ideas when practising the clear-cut.

The selection structure of mountain forests in extreme conditions is a rule (for example at timber line, or under occasionally emerging extreme conditions).

Observations made of different mountains tell us how nature reacts under severe conditions. At the timberline, and also under extreme life conditions, specially structured bio-substance can be observed. It is a richly diversified structure, also called a “selection structure”, those structures appear on sites where site conditions do not allow development of the so-called optimal phase. Taking into consideration the fact that the forest and nature are becoming more and more stressed, the practising of the selection cutting system could become, in general, a first class foresters’ help. This is true, of course, only when developing an appropriately sophisticated selection cutting technology.

Mountain forests and their enormous retention capacity

Slopes and the flow of substances. Slopes and entropy. Slopes and wildlife with their functions. Shrubs and grasses on slopes.

The forest ecosystem, in its unique complexity, possesses fantastic retention capacity. This property is evident from the way forests hold within themselves all accumulated energy and bio-substances. On mountain slopes, this patent must be uniquely designed (by nature) to respond to gravity. In spite of the slope surface, the flow out of the ecosystem (output) is rather modest and very useful for the neighbouring ecosystems. The drop-wise dispersement of small quantities means, physiologically, very effective nutrition for neighbouring ecosystems in which nothing is lost and entropy is low. A special part of the shift of energy and bio-substance is the animal component of the bio-substance which helps to bring the bio-substance (for example seeds) upslope. The retention capacity mechanism must be also perfectly designed within the forest soils combined with all of the living components of the forest.

The dying bio-substance in the forest, a crucial part of the forest life, plays an important role when decaying very slowly. The slow decay of vigorous trees and their strong roots and stock represent an additional nutrient property when giving life substances, habitats, etc. throughout centuries, to the permanently occurring life processes of the forest.

The “energy household” in the forest ecosystem under extreme mountainous ecological conditions.

The capability for high gross production of bio-substance in an abbreviated growing season. In spite of these conditions there is a high growing stock – a warning for forest managers.

Briefly listed above, these properties tell us how carefully the mountain ecosystem manages the energy it receives. To keep alive and vital, it needs to collect energy from the

existing environment. The energy household mirrors, the structure of forest bio-substance in its amount and form. In the mountain forests under extreme living conditions, we admire how high the gross production of bio-substance is in their abbreviated growing season. The huge growing stock inspires us, because there is not a sustainable economy without a large growing stock; it is one of the factors buffering against risk. There is no successful forest or forestry based on the classic model of the normal forest and its age classes. The mountain farmer of earlier times was a good observer. He copied the forest and designed his farm with high investment (growing stock) and modest interest (increment) – a model for a sustainable close-to-nature economy.

Respect for local races and the consequences of disregarding their importance.

Clusters – the unique structuring of bio-substance in mountain forests.

The secrets of structuring call for an insect's compound eyes and multi-dimensional observation.

Not only respect for local races, but also respect for the structure of bio-substance and the consequences of disregarding their functions, are important. Typically, timber-oriented forestry only sees the stock of wood in the forest. Looking at forestry from an ecologically oriented viewpoint, it becomes obvious how unique stand structures are. The so-called “cluster” structure in mountain forests is evident and it is also observed in other semi-natural forests. In fact, every forest is clustered. In some cases you can find individually standing trees. The clustering begins in initial stages where small groups, which are locally conditioned appear with many young plants. Those small groups grow together, building a cluster at the pole-stage. We can observe the clustering even in mature stands where two or three clusters start building a new larger cluster. In the late mature stage, dis-aggregation starts and we can find more individuals standing “independently”. In front of our eyes we can clearly observe the film – the clustering of the individuals within the morphogenetic fields where two forces, protagonistic and antagonistic, are actors according to Sheldrake: protagonistic-building clusters (nucleus), the antagonistic against clustering, let me say in order not to get huge agglomerations and to keep the stand fine-grained. Each cluster seems to be a copy of the individual tree (the form of the total tree with the crown and the root plate). The morphogenesis of the cluster itself and its functions explains the stability of the group. It also explains the support and the competition of the individuals within the clusters. In a cluster-shaped mountain forest we find a modified stand climate because of the small openings between some clusters with good conditions and leaving place for other species. This is the way of supporting biodiversity. Within the cluster, the trees function like shock absorbers, and the central part behaves like a neutral zone where the high-quality-wood can develop. On the other hand, in the stand, all the clusters function as a shock-absorber system when the strong mountain winds, snows, and other violence endanger the forest. To understand the real character of a naturally structured forest we have to learn from multi-dimensional observation.

Lessons from virgin forests

*Virgin beech (*Fagus Sylvatica*) forests and their response to stress. The enormous reaction capacity of individual trees in virgin forest stands.*

As an example, we can explain some lessons from virgin forests. The high vitality of naturally structured mountain forests can be seen by the enormous response capacity of different tree species when they are heavily stressed.

Examples: Once heavily damaged, mature natural beech stands damaged by ice recovered vigorously after years. I investigated the rest of the still remaining and still growing trees after 40 years and found a fantastic recovery.

As result of a research project to simulate ice-break in a mature beech stand it was found that small crowned trees among the well-developed trees and individuals were released (removing all the tree competitors around small-crowned individuals). We observed the development response of diameter and the basal area of crowns, and we found that those trees reacted very strongly. After 17 years the diameter had increased up to 50% and the basal area of the crown up to 100%.

In natural mountain forests, 100 to 200 and more years old, suppressed beech, spruce, and silver fir trees with small diameters, between 15-20 cm, and 5-10 m height, are able to respond when the surrounding environment changes. In the upcoming 100 years they will become giant trees.

Similar research findings show how wrong we are when we remove all of the trees, even damaged ones, for example, after a disaster or destruction of the stand. Instead of honouring the vital and adapted trees as resisting heroes, we punish them by cutting. The natural recovery of destroyed stands without human intervention can in many cases be much more successful in comparison to the intensive human interventions. In this way we slowly start to understand how questionable real information about the forest's character is.

Close-to-nature management principles have to become the rule when tending mountain forests.

The high diversity of sites must lead to the permanent accommodation of nature with the intention of supporting or propagating life in severe site conditions and increasingly unpredictable stresses, changes, etc. which themselves create nature. Recognising this truth, the forester has to develop management methods with a high degree of flexibility; calling them the "free-style of silviculture" based on some general principles.

The holistic approach toward maintaining mountain forests

The mountains dictate, not us.

Holistic thinking means considering everything in its entirety, especially interrelationships, and never single factors in isolation. Consideration of isolated entities means the

beginning of the destruction of nature and the mismanagement of forests, in general. The mountain forest is an organic part of the mountain landscape, furthermore, it is part of a larger landscape. This means that the mountain dictates, not us. There are some general aids which can help us to think holistically, for example, as mentioned in the beginning: assistance in developing some rules, like managing the forest without disturbing the water regime. If we manage the forest in a way that we never disturb the natural biological water regime, then there is no danger we are going to spoil the landscape.

The mountain forest as teacher, as a place for enrichment of our perceptions, and a source for experiential learning.

What we need is real information (but we are not willing to understand).

Information has to be considered a superpower which dictates. The new trends in information systems endanger nature. Because of the non-holistic orientation of modern information, close-to-nature forestry itself can be endangered. The immense quantities of information do not allow us to collect true information for collaboration in a close-to-nature way with different natural ecosystems. It is obvious that information without personal experience cannot be real information. It is “half information”. Managing nature with such “half information” means the destruction of nature. One-sided (non-holistically shaped) information is unproved information, unselected information which we use in most cases when spoiling nature and our environment. To get the true information, forestry has to look for its own way of collecting information by studying the character of information systems which function within every natural forest ecosystem. We are interested in how the information system functions as a part of the forest ecosystem for the famous self-perpetuating life of forest ecosystems. We must not copy and follow the modern trends of the artificial world of information. Forestry has its own natural substrate, the forest, which we can use as our lab. To collect true information means being organised in an appropriate way where the planning and realisation are combined in the same person. Otherwise the information remains “half information”. This method of collecting units is called the cognitive method. In forest activities, where planning and execution are divided into different offices, success cannot be achieved. The character of cognitive types of communication with nature is characterised by small steps and permanent proof. The cognitive approach is nature-inherited. We have to follow nature like the ancient farmer when he settled in the mountains. He investigated his new environment step by step (moving ahead and returning, etc.). To find the truth about the real character of the forest ecosystem, we have to go to the mountains where the severe life conditions show us the real nature of the functioning of the forest ecosystem. There is no artificial lab which could replace the natural lab of a mountain forest ecosystem. The natural forest ecosystem lab is one of the ways of learning what kind of forester; what kind of forestry organisation; what kind of general economy; what kind of water management; what kind of education; what kind of models, etc. we need and are obliged to develop.

2. CONSIDERATIONS

Profit-oriented society is heavily in contradiction with forest ecosystems, and in disagreement with close-to-nature forestry and its pioneers. Forest ecosystems, especially mountainous ones, show us how mankind must not live from capital, but from yield only. Usually, the profit is vampirised, as is shown from the misused increment. We do not want to understand that the increment has to be returned, mostly locally, according to all ecological rules. The robbery, or extortion of nature, called "profitability" has many who would excuse this behaviour in the scientific community. But mountain ecology shows us that there is no excuse. The mountains tell us how wrong we are in our economy. All of the peri-Alpine and Alpine countries, once forested landscapes, were devastated by profit-oriented treatment of nature and changed into torrent landscapes. Nature then became more and more severely extreme, with a growing unpredictability. Extreme nature is the best teacher, however, and many of these countries subsequently refused old approaches instead of other ways.

Our knowledge of mountain forests and landscapes is still like a fig leaf for the forestry practice. Forest science imagines well what the character of that forestry is, but we need more. We need more basic knowledge which could help to understand the magnitude of the mountain forests in order to stop spoiling nature in general. To invent and demonstrate ways in which to make humans themselves a sustainable natural resource could be a basis to cease spoiling the environment. We have to discover the importance and the general values of mountain forests and their landscape; for the sciences, for life, and for the management of renewable natural resources, in general. Then we must come to the conclusion: A happy country possesses a mountainous landscape. This country has to undertake everything to keep it preserved. When discovering the real truth about the forest and its importance, we have to state: 1) the forester is a real landscape medicine man and in this connection, 2) the project for the 21st century has to be the majesty, the forests, with the forester as the real landscape medicine man.

SUMMARY

Mountain forests are a fundamentally important eco-niche in the landscape. Because their functions are not well understood, or their importance not adequately respected, mountain forests are often misused. Clearly, the reality of the role of mountain forests in the landscape has to be better integrated into our day-to-day thinking. The rule is simple and can be explained as follows: "healthy forest in a healthy landscape" => "mens sana in corpore sano." Applying this rule, we would realise, for example, that a clear-cut should be viewed as a monster, producing freak forests, and freak landscapes.

Today, the Alps are faced with two extreme trends. On the one hand, agricultural abandonment, and on the other, over-use (an over-population of tourists). Both of these result in their own kind of desolation. Some key characteristics of mountain forests inform us of the management we should apply. The character of a mountain forest is of high growing stock with high bio-substance and enormous retention capacity. Mountain

forests thus have a highly specialised “energy household,” resulting in diversified structure.

Lessons from virgin forests show us the magnitude of the capacity of individual organisms in mountain forests to endure stress. The specialised structure of bio-substance in forest stands is reminiscent of a “shock absorber” and serves to diminish the force of disturbance agents such as wind and snow, which can exert tremendous influence on the forest. We often fail to consider the important role of dead bio-substance in mountain forests, and need to pay more attention to such elements. This means that we have to learn to accept that, in most cases, in the end, it is the mountain that dictates policy, not us. The mountain forest must become a place for enrichment of our perceptions via experiential learning. Therefore, forestry has to invent, and then demonstrate, ways in which humans can work in partnership with nature, as part of sustainable natural resources. For the future, foresters must become medicine men for ailing landscapes. Their goal for the 21st century must be to restore forest management practices to a quality befitting the majesty of forests.

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PUBLIC PERCEPTION OF MOUNTAIN FORESTRY AND FOREST POLICY

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1. E3-COST PROGRAMME AS PROJECT INITIATOR

On 16th May, 1994, the Swiss Government decided to participate actively in the COST E3-Action “Forestry in the context of rural development”. At the same time, the Swiss Federal Office for Education and Science commissioned the Chair of Forest Policy and Forest Economics at the ETH Zürich, firstly, to represent Switzerland on the Management Committee of COST E3-Action and, secondly, to prepare a project proposal within the project groups 1 and 3 of the COST-Action. Objective of project group 1 was to provide scientific and comparative data on public perception of forests and forestry and on the attitudes of farmers and forest owners towards forestry as a means of rural development. Group 2 focused its research on the role of forests in protecting rural areas in mountain regions. The project proposed by the Chair of Forest Policy and Economics tried to cover both aspects, namely public perception of and attitudes towards forestry in mountain regions. The large share of publicly-owned forests (approximately 70%) and the paramount importance of mountain forests for a typical Alpine country such as Switzerland made us focus our project on these two main aspects. In agreement with the Swiss Federal Forest Office and the Swiss Federal Office for Education and Science, and based on a recommendation of the COST Management Committee, our project “Perceptions, attitudes, and prospects of the rural population with regard to forests, forest economy, and forest policy” was started in September 1994.

Key words: Forest policy; perceptions and attitudes; survey; Swiss mountain regions.

2. FOREST POLITICAL AND THEORETICAL BACKGROUND

2.1 The forest political environment

In Switzerland, a new Forest Law came into force on January 1st, 1993. With the Forest Law approved by Parliament and the statutory regulations issued by the Federal

Government, the country now has a new national forest policy. Forest political activities are now dominated by the implementation of the various controlling instruments. The survey on public perception of forests and forest policy covers the entire policy cycle, from the formulation of the programme to its implementation (Schubert 1991 and Windhoff-Héritier 1989). The programme-oriented approach is based on the understanding that any political activity is a permanent process of developing political concepts. Neither the goals nor the selected controlling instruments are fixed elements. They are, particularly in democratic countries, open to permanent criticism and appeal, and call for constant justification and legitimization. This need for legitimization is particularly pressing when the target group of people affected by a certain policy measure is large and heterogeneous, and when its interests or demands have not been assessed carefully and not been taken into consideration sufficiently in the programme formulating process.

Both elements (heterogeneity and consideration) characterised, at least to some extent, the process of formulating the new Swiss forest policy in the eighties (Zimmermann 1992). It was initiated by the new "forest decline" phenomenon. The discussion of forest decline changed the forest political scene in Switzerland fundamentally in the mid-eighties. Owing to the connection between forest decline and environmental conservation, the forest became a major theme of inland politics over night, after having previously been a "non-theme". Those involved in forest policy used this upsurge of interest to achieve a long-overdue and economically oriented revision of the eighty-year-old forest law. As time was short, the new forest political concepts were formulated and their meaning defined mainly by the responsible Swiss Federal Forest Office. Mainly for reasons of time, past experience in forest policy matters and the present needs of forestry were used as a basis. The draft programmes thus worked out were finalised together with the cantonal forest services and then submitted for external comment to the cantons, political parties, trade associations, environmental and recreation bodies. Main actors at this stage were the environmental conservation and recreation people on the one hand and the cantonal governments, as instructed by their forest services, on the other hand (BFL 1987, BBI 1988 III 173). The draft law submitted to Parliament can thus be said – if somewhat pointedly – to be a forest political programme formulated by the forest services with the co-operation of idealistic organisations. The public – and thus the majority of the forest owners – knew little, if anything, of these activities for drafting a new forest law and took no active part in the process. Democratic legitimization was therefore based on deputation.

The draft law worked out by the Forest Service and, to some extent, influenced by various groups was accepted by Federal Council and Parliament without any fundamental changes. The discussions (mainly in the National Council) concerned individual paragraphs only, but never the general direction or philosophy of the Forest Law (Zimmermann 1992). The wide acceptance in Parliament may be due to the fact that the legislator used largely open or little binding wording, delegating decisions in case of conflicting interests implicitly or explicitly to the Federal Council, the cantons or the law courts. It is therefore unlikely that the new Forest Law will have much normative and controlling influence. This is particularly true of the new regulation of forest utilisation. In the article of intent, the legislator explicitly promotes the concept of multi-purpose forests. There is no mention, however, which forest function should be preferred. Look-

ing at the national forest legislation as a whole (Forest Law and statutory regulations), it can be assumed that this decision is to be made on the cantonal, regional, municipal or even owner level. Owing to the open and imprecisely formulated stipulations on forest utilisation, all parties concerned felt themselves to be potential winners, and, therefore, saw no reason to call a referendum. With everyone a “winner”, there was no wide political discussion of the content of the forest law in the media, and the public was not given the opportunity to vote on the subject and therefore probably does not know very much of it. The actual democratic legitimisation of the new forest legislation is thus somewhat uncertain.

The Federal Forest Law has now been in force for more than three years, and its implementation is well underway. Implementation is done on two levels: on the one hand the cantons are in the process of elaborating their own statutory legislation for the Federal Forest Law, and on the other hand, the Federal and Cantonal Forest Services apply individual instruments to practical cases. Since most cantons have a compulsory referendum for the adoption of any laws, the cantonal legislator has to take into consideration wishes and demands of the population to a far greater extent than the federal legislator. Most scope is given to the cantons in the area that probably interests the general public most, namely use of the forest for the purposes of recreation, timber production, nature conservation, or protection. As first examples of cantonal forest laws show, cantonal legislators, too, have a tendency towards compromise and delegation (Schweizerische Zeitschrift für Forstwesen 1996). The political debate on the conflicting wishes, values and demands of society on the forest and the subsequent evaluation are delegated to the statutory authorities and from there partly to the law-enforcement agencies.

This development, also to be caused at least partially by the concordance principle, means that implementation is becoming increasingly important as regards the control of social developments. Decisions of importance to society are no longer taken by democratically legitimised authorities but by subordinate authorities. The Forest Law is an exception, in this respect, in so far as the legislators have taken the essential decisions regarding forest conservation, themselves (ban on clear-cutting; exemptions thereof; reforestation obligation). As regards forest utilisation, however, the delegating mechanism mentioned previously is fully effective. Whether and how the forest should be utilised is, on the one hand, a problem of forest planning, and on the other hand a question of subsidies. Even if Parliament has budget autonomy, both these instruments are still firmly in the hands of the national and cantonal forest services.

2.2 Forest Policy in a new political environment

Fundamental changes are also likely to occur in forest policy matters due to new political developments and events such as the scarcity of public funds and the resultant or renewed call for effective public management (New Public Management) and for deregulation, the newly begun discussion on subsidiarity and federalism, and, last but not least, the replacement or extension of hierarchical controlling instruments with informal co-operative controls (Kissling-Näf 1996, Müller 1996). Such changes are best described with “more responsibility for forest owners” and “democratisation of decisions

on forest utilisation". Both developments result in an increased involvement of the communes in forest utilisation matters. By means of financial decisions and in the forest planning process, they will also decide on forest utilisation and infrastructure facilities to be built in the forest. In both cases the population concerned has a far-reaching political and legal say in these matters and rights of opposition. As regards silvicultural measures, this is done through forest planning which is increasingly submitted to public approval. In future, forest infrastructure facilities are also likely to become an integral part of forest planning. They are already subject to public control and approval within the framework of regional planning or building permission processes. The public is given most say because of the forest ownership structure and the financial situation of forest enterprises: the forest ownership structure in the Swiss mountains is characterised by a high share of publicly-owned forests, belonging mainly to the communes. What can or should be done in these forests will, to a substantial degree, in future be decided in the annual budget approval process. Most communes still require a primary assembly or a public vote on the budget, respectively. Public influence will increase with the growing deficit of the municipal forest enterprise and when contributions by the Federal State and the cantons are decreased or even no longer paid out. Both possibilities are likely to occur within the next few years.

2.3 The importance of opinion polls in the new forest political environment

In view of the developments in forest policy and general politics, it is likely that decisions on the utilisation of forests will be taken increasingly on a regional or municipal level. The superior authorities provide the framework and offer incentives whereas the forest owners, i.e., mainly the communes, decide what to do within that framework and which incentives, mainly financial, to use. Direct democratic decision processes continue to be highly regarded in most mountain communes. This applies in particular to budget and planning decisions, two sectors of special importance for forest utilisation. To know and take into consideration the demands and wishes of the population concerned, in good time, is of interest both to those taking the political decisions and to the forest planning authorities. If these legal and legitimate demands are not at all or not sufficiently taken into account, the political authorities risk a refusal of their proposals by the voting population or difficulties when implementing individual measures without approval of a majority. On a municipal level, opinion polls could provide important information and data for policy formulation (mainly for forest planning) as well as the implementation of forest political measures. Results of opinion polls could help to make implementation more effective and efficient. We know from implementation research that the effectiveness of measures largely depends on the general acceptance by the population concerned (Windhoff-Héritier 1989, Peters 1993).

Similarly, opinion polls can also be used by the higher authorities. In particular when carried out regularly, opinion polls can inform early on sociological developments and changes (changes in values). Forest history shows that the demands of society on the forest are subject to permanent change (Bloetzer 1992, Jaissle 1994, Zimmermann 1989). In politics one has to react in time to a change in attitudes of society, if one wants acceptance and does not want to risk rejection. Continuing delegitimation, decreasing

credibility, and inefficient activities of governments are possible effects of a lack in adaptation strategies (Müller 1996). An adaptation of state politics to changed values of society can occur both on the programmatic and the implementing level. The imprecise and open laws, described previously, frequently offer the possibility of corrections on the implementation level, at the expense, however, of democratic legitimization. For example, the history of Swiss forest legislation shows that in most cases by adapting the implementation instruments (a) consideration of changes in societal values is possible, (b) basic changes of a policy can be avoided, (c) implementation of individual instruments can be improved continuously, i.e., be made more effective and efficient. This second, implementation-oriented aspect is in the foreground of the present COST study.

3. METHODOLOGICAL APPROACH AND PRESENT STATE OF THE PROJECT

As mentioned in the introduction, the present research project was initiated within COST-Action E3. Initiator was the Swiss Federal Office of Education and Science, executor the Chair of Forest Policy and Forest Economics at the ETH Zürich. Duration of the project is 40 months (September 1994 to February 1998). Sociologists, forest engineers, and lawyers are involved in its preparation and execution.

A cross-section survey was made to assess attitudes towards and opinions on forests, forestry, and forest policy at a given period of time (spring 1995) of a group of people living in Swiss mountain regions (Diekmann 1995, Schnell et al. 1992). The survey was made by means of a questionnaire mailed to a random portion of the voting mountain population. Within this basic group, a further and intentional selection was made of cantons and communes. This involved the following:

- 2 cantons each of the three forest regions of the Alps, the Alpine foothills, and the Jura
- 6 communes each per canton with a population ranging from 200 to 5,000
- 60 members each of the voting section of the communes
- 2 members each of the local government authorities (mayor, head of the forest sector)

A total of 2232 people were selected and posted the questionnaire by this largely random selection process. They were asked to complete and return the questionnaire within two months. Within this period 656 questionnaires were sent back, namely 43 by members of the local governments and 613 from the general public. This is a return rate of approximately 29% for the population, and 60% for the local governments. The data was then processed with SAS 6.10 computer software and statistically processed and evaluated. The descriptive SAS analyses were made in the second half of 1995 and summarised in a first intermediate report for the project initiator. At present, we are evaluating the open questions and interpreting individual results. The project should be finished by the end of 1997 with the publication of a final report.

4. FIRST RESULTS OF THE SURVEY

The aim of the present COST project was to gain information on attitudes, perceptions, and opinions of the mountain population on the subjects of forests, forestry, and forest policy in their surroundings, i.e., the mountains. According to this goal the questionnaire was subdivided in the following four parts:

- Attitude towards and personal relationship with the forest
- Assessment of forestry, in general, and of forest activities
- Assessment of forest policy goals and instruments
- Personal data

The questionnaire contained a total of 25 main questions, most of them with a selection of possible answers, and 13 additional mainly open questions. Main emphasis was on questions concerning general forestry and forest policy, as is also the case for the following selection of first results. There is not enough room here for a detailed analysis. This applies in particular to the difference in replies, often interesting, by the members of the population and the local government. The following rough assessment refers to members of the population – with very few exceptions.

4.1 Attitude towards and perception of the forest

Two separate questions were asked to find out the importance of the local forest (a) for the person himself and (b) for the region concerned. The set answers mainly included the usual forest functions also mentioned in paragraph 1 of the Forest Law. The answers given as to personal appreciation and regional importance provide information on the weighing and ratings of individual forest functions (figure 1). The replies show that there do not seem to be substantial differences between personal appreciation of the for-

Figure 1. Personal Appreciation of Forests

<u>Now</u> <u>In future</u>	little importance	medium importance	great importance
growing importance			Natural space Protection of environment Recreation
similar importance		Place of work Tourism Economic factor for regional development	Timber supplies Landscape
decreasing importance			

est and assessment of its regional importance. In both cases the so-called welfare functions (recreation, nature and landscape conservation) as well as the protection function of the forest are given priority. The economic function of the forests, however, is considered to be of somewhat secondary importance. Surprisingly, as regards personal appreciation of the mountain population, the landscaping function of the forest is considered to be more important than its protection function which is considered to be about as important as the recreation function. A similarly surprising picture is given by the replies regarding the regional importance of mountain forests. Again, the protection function is listed as second in importance to the forest as a natural space. Least importance is attributed to the forest as an economic factor. Similar ranks result from the respondents' views of the future importance of the mountain forests: In the eyes of the mountain population, the importance of the mountain forest as a nature reserve, as recreation forest, and as a natural protective element will gain, whereas the landscaping function and the economic importance of the forest will more or less retain their present places.

A further question refers to the regional state of the forest (figure 2). Surprisingly, a large majority of respondents (approximately 84%) consider the forest to be in a good or satisfactory state. A mere 11% feel that "their" forest is in a bad or very bad condition. The overall assessment shows that the present situation of the forest is not a source of special worry for the mountain population. In this connection, mention must be made of a remarkable difference in the general assessment. According to the replies from the Alpine region, the forests there are considered to be significantly worse off than are those of the respondents in the Jura and the Alpine foothills.

In an additional open question, comments were asked for regarding the assessment of the forest situation. By far the most important evaluation criteria mentioned were the maintenance and tending situation of the forest and the state of the trees, and these both positively and negatively. The same criteria were used in the replies to the open question as to the most important threats to the forest (figure 3). Far more than 100 times each, the three risks – natural hazards, environmental pollution, and forestry – were at the top of the list of all risk categories. A detailed analysis of the mention of "forestry"

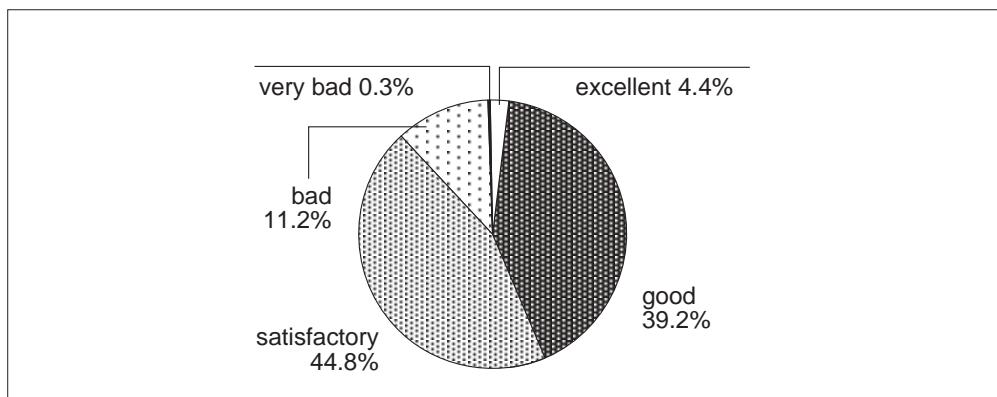


Figure 2. Assessment of Regional Forest Condition

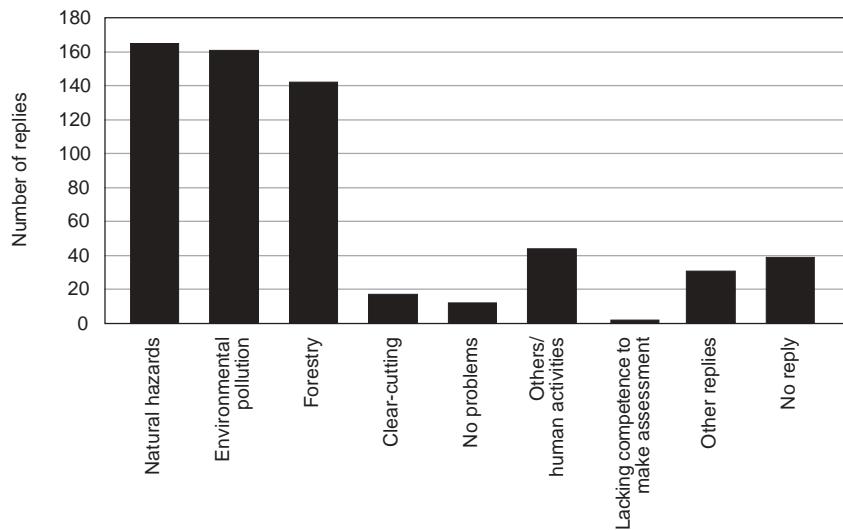


Figure 3. Problems and Hazards for the Forests

as a source of danger, an analysis of particular interest to us, shows that “lack of tending/utilisation/maintenance” is in a dominant position. The replies to the two questions could be interpreted as meaning that a considerable number of respondents criticise method or amount of tending and maintenance.

4.2 Evaluation of forestry

The forestry questions mainly referred to the assessment of forest activities in addition to that of ownership structures and the state of forestry. Once again, the concept of “forest tending” is dominant. The mountain population considers forest tending and regeneration and the elimination of forest damage to be by far the most important activities in the forest: Some 95% of the respondents consider these activities to be important or very important (figure 4). Protection and care of fauna and flora, tidying-up in the forest as well as game management are considered to be nearly as important. Less importance is attributed to the following activities: construction and maintenance of recreation facilities, public information and guided tours, forest road construction, timber harvesting and sale of timber. It appears from these negative preferences that artificial or technical facilities in the forest and classical timber harvesting are met with some reservation. This negative attitude is contrasted by an enormous acceptance of curative silvicultural interventions and activities in relation with nature conservation. The mountain population believes that the two fields of activities, forest tending and nature conservation in the forest, will become more important in the future. They do not feel that any of the activities listed will notably be less important in future.

The respondents were then asked who should bear the costs of these measures. Although the replies vary considerably, it is evident that the costs should be borne both by

Figure 4. Appreciation of Forest Activities

<u>Now</u> <u>In future</u>	little importance	medium importance	great importance	very great importance
growing importance				Tending / regeneration Protection / tending of fauna and flora
similar importance	Recreation facilities	Information of general public. Timber harvesting/ sale. Forest road construction/ maintenance	Game management Control/ supervision	Curative interventions
decreasing importance				

the forest owners and the state. Only about a fourth of the replies opted for the forest owners to bear most of the costs. A very large majority suggested that the state should assume major financial responsibility, but differed as to the appropriate state level (national, cantonal or municipal). Some 42% of the replies opted for the Federal State to bear the major financial burden, whereas about one fourth attributed this responsibility to either the canton or the commune. A clear majority found that the costs of forest activities should not at all or not primarily be paid for by the visitors of the forest. Some 30%, however, felt that forest users should contribute towards the costs.

4.3 Evaluation of government forest policy

The questions on forest policy mainly concerned the three concepts of “general forest policy”, “forest policy institutions”, and “forest policy instruments”. Additional questions were asked to gain information on individual attitudes. This was particularly necessary for the question on the degree of satisfaction with official forest policy, since it was likely that concept and meaning of forest policy would be somewhat vague. This was confirmed by the fact that some 35% of the respondents did not reply to this particular question. Among the people confident to make an assessment, it is interesting to note that more than 60% are generally dissatisfied with government forest policy. The following arguments are used to explain this feeling (figure 5):

- lack of forest tending
- too many forest roads
- bad forest condition
- insufficient state involvement
- general dissatisfaction with politics

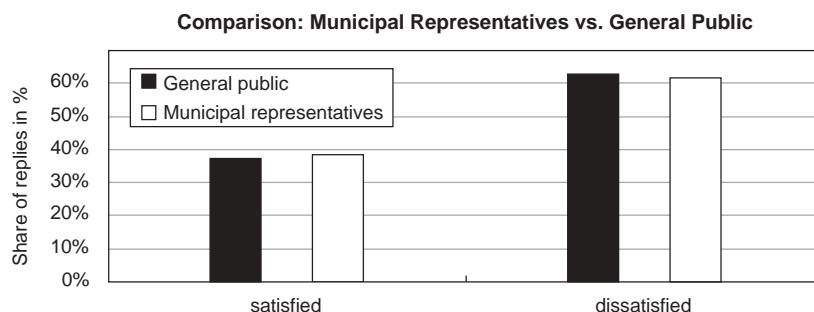


Figure 5. Degree of Satisfaction with Present Government Forest Policy

The concept of forest tending is yet again in the foreground of the thoughts and assessments of the mountain population as was already the case with forest activities. This is confirmed by those giving a positive assessment of forest policy. Here, too, tending and maintenance of the forest are clearly at the head of any replies, followed by regeneration and reforestation, forest policy in general, nature conservation and the new forest law. The image of government forest policy, and thus, also public opinion, is therefore mainly influenced by the state of the forest or by individual forest activities rather than by policy concepts or political bodies.

The evaluation of the most important institutions in the field of forest policy was the subject of a separate question. As with general forest policy, the respondents do not appear to be overwhelmingly satisfied (figure 6). Assessing the governmental bodies, the degree of satisfaction is greatest at the bottom of the hierarchy and lowest at the top: The municipal forest services and the communes are given the best marks, whereas the cantons and particularly the Federal Government are far less appreciated.

The share of the respondents who are explicitly dissatisfied with a certain group is particularly interesting. The forest owners have been attributed the highest share of dissatisfaction. The activities of this group are therefore rejected most frequently. Only the Federal State received a similarly high share of dissatisfied mentions. However, the degree of dissatisfaction is considerably smaller with cantons, communes, forest services and nature and environmental conservation people. The overall assessment of the present activities of environmental conservation groups is surprisingly positive. However, there are enormous differences between the assessment of the population and that of

Figure 6. Assessment of Specific Forest Political Actors

Not very satisfied with	Reasonably satisfied with	Highly satisfied with
Forest owners	Federal state Cantons Communes	Forest service
Other organisations interested in forests	Nature conservation and environmental protection agencies	

the government representatives. Municipal representatives have a far more negative opinion of environmental associations than the general public.

The question on the degree of satisfaction was coupled with the question on desirable future involvement in forest political affairs of the institutions concerned. The general feeling was that none of them should do less (figure 7). More than half of the respondents felt that both state and forest owners should become more involved. The Federal State, in particular, already rated by the population to be the most important factor in forest policy matters, is asked to do more. Again, the results concerning environmental organisations are highly interesting. They are given by far the largest number of responses (about 20%) under the heading of "do less" whereas on the other hand some 68% of the population want them to "do the same" or even "do more" in forest policy matters. Here again, there is a large discrepancy between the opinion of the population and that of the local politicians. On the whole, the attitudes regarding future forest policy activities show that both State and forest owners should do more for the forest. This is confirmed by the answers to similar questions.

A further set of questions was meant to assess the attitudes of the population towards two central forest political measures or instruments in Switzerland. A first question concerned the present clear-cutting practice with which about half of the respondents agreed (figure 8). For about one sixth it was either too severe or not severe enough. The members of the municipal governments did not agree with this: 47% of them believed the clear-cutting practice to be just right, for 45% of them it was too severe!

Five questions were devoted to government subsidies, which, at present, are probably the most important forest policy instrument. After having been informed of the total sum of subsidies paid out per annum in Switzerland, the respondents had to comment on this sum. Some 60% of the population felt that this amount was just right and should be maintained in future (figure 9). Nearly one third propagated an increase whereas less than 10% wanted the sum to be reduced. 60% of the members of local governments wanted more. The question on who should be responsible for what amount of the forest government subsidies gave a clear picture. The mountain population wanted the Federal State to pay 50% of the subsidies, the cantons 30% and the communes the remaining 20%. The answers of the local government members give almost the same picture: 60% federal, 30% cantonal and 10% municipal contributions. This corresponds more or less to the present situation. It further shows that forest conservation is considered to be a common task and that the communes are ready to pay their share.

The respondents were also given the opportunity to indicate their priorities for government subsidies. More than 80%, in some instances even over 90% of the respondents

Figure 7. Desirable Future Involvement of Forest Political Actors

To do more in future:	To do the same:	To do less in future:
Federal state	Forest service	
Cantons	Other organisations interested in forests	
Communes	Nature conservation and	
Forest owners	environmental protection agencies	

felt that the four sectors “forest tending and forest conservation”, “fight against harmful insects and forest decline”, “reforestation” and “avalanche protection works” should get financial public support (figure 10). In 97% of the responses, forest tending is once again in an absolute prime position. Tidying up litter and debris in the forest, nature conservation, employment of local labour in the forest, supporting forest enterprises and

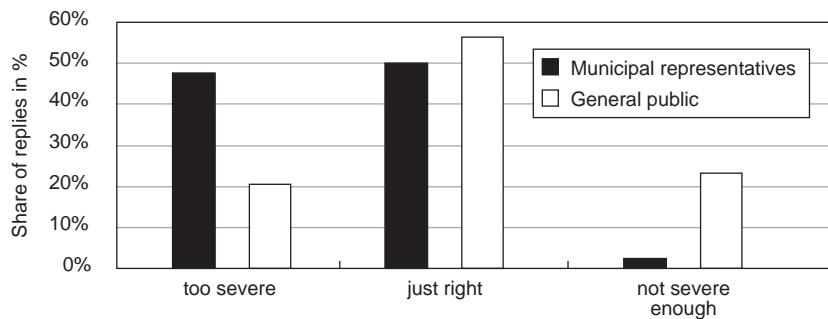


Figure 8. Assessment of Present Clear-Cutting Practices

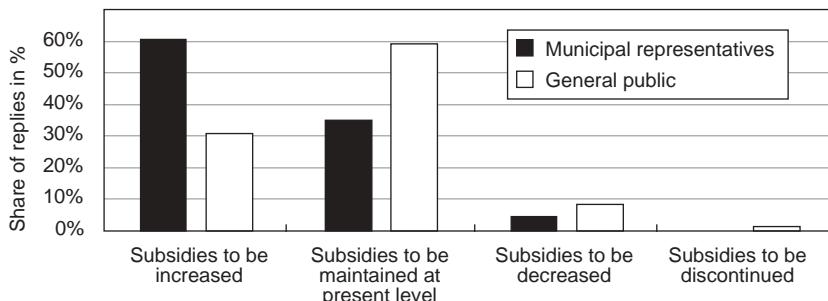


Figure 9. Assessment of Present Practice of Forest Subsidies

Figure 10. Future priorities for government subsidies

little importance	medium importance	great importance	very great importance
Building/maintenance recreation facilities	Forest enterprises	Tyding up in the forest	Forest tending/maintenance
Building/maintenance forest roads	Encouraging nature conservation in the forest	Defense works against natural hazards	Fight against harmful insects/forest decline
Information of general public	Providing local employment	Afforestation	
	Timber production		

timber production were also mentioned as justifying subsidies. A majority of the respondents, however, did not feel that the construction and maintenance of recreation facilities and of forest roads as well as public information should be subsidised or, if so, not very highly. The opinion of the population as to priorities for subsidies, corresponds largely to the subsidising policy of the Federal State, and the measures proposed by the population agreed largely with the budget proposals of the Federal State. Forest roads and forest infrastructure facilities are an important exception. The subsidising authority – and the local politicians – considered them to be of far greater importance than did the population.

5. CONCLUSIONS AND OUTLOOK

The COST study presented here does not claim to provide representative results in a strict statistical sense (Diekmann 1995, Schnell et al. 1992) of the attitudes and opinions of the Swiss mountain population regarding forests, forestry, and forest policy. However, the large amount of data allows specific trends and prevailing opinions to be deduced with regard to the complex relationship between society and forests in a certain region. This is particularly true of those replies showing common or prevailing opinions. Such dominating patterns of opinion can be found in all three sectors investigated. The general attitude towards forests is characterised by differing and varied perceptions of the forest. The protection forest is not a dominating element but just one among many others. The attitude of the mountain population towards forestry shows that the economic importance of the forest and timber production is not considered to be particularly high. However, the forest managers ,i.e., the local forest services, are very highly regarded by the local population. This may be due to the fact that, in the eyes of the mountain population, foresters are mainly concerned with forest tending and the prevention of forest damage. The concept of forest tending, in particular, is so highly regarded by the population that it forms a proper capital for forestry and forest policy. As forest activities are concerned, it is now and will continue to be by far the most acceptable one. The public would seem prepared to pay for forest tending, since the respondents were nearly unanimous in indicating that the state should help the forest owners to cover the cost of forest tending interventions and additional curative measures. In so doing, the Federal State, as a comparatively removed agency, should bear most of the burden, although the communes should also accept a considerable share of financial responsibility. The present promotional policies of the state may coincide largely with the expectations of the respondents; on a municipal level, however, there is still substantial room for forest policy activities. This becomes less as soon as construction of technical infrastructure facilities or traditional timber utilisation are involved. Slogans such as “forest roads – ways of forest tending” or “timber utilisation in accordance with nature and environmental conservation” either did not reach the population or were not accepted at all or accepted with reservations only. Forest policy offers two possibilities of reacting to these findings: renewing efforts to inform the population or adapting forest political instruments, or their implementation, respectively, according to the demands and wishes of the population.

The results of the COST enquiry may be an indication that the population of the mountain regions and that of the Swiss lowlands are becoming more and more similar as to perceptions of and attitudes towards forests and forestry. Should this be so, it would appear that future demands of society on forests would be similar for Switzerland as a whole. A continuation project of 2.5 years' duration for verifying this hypothesis has just been started by the Chair of Forest Policy and Forest Economics, the ETH, and the Sociological Institute of the Zurich University. Project initiator is the Swiss Federal Forest Office which intends to create the basis for a permanent systematic assessment of the demands of society on the forest. The existing forest observations, mainly of scientific orientation (National Forest Inventory and Sanasilva), are to be complemented with a sociological survey of society focused on forest and environment.

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(Translation: Rosmarie Louis)

DISCUSSION 3

Monday, 5:00 – 5:30 PM

Andreas Ottitsch

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SUMMARY OF THE DISCUSSION

The special problems of mountainous forest areas were the main focus of the discussion. The contributions dealt with the relationship between economy and ecology in forestry, as well as with ethical issues concerning the rights or the responsibilities of humans towards nature. Prof. Zimmermann's studies were also discussed from a methodological point of view, as well as with regards to the implications of those results, especially their acceptance among different stakeholders.

The discussion started with questions posed by Prof. Koch to Prof. Mlinsek about his opinion on the role of thinning in the development of mountainous forests, and then to Prof. Zimmermann regarding what he intended to do about the 70% non-respondents with regards to the results of the study which he presented in his paper.

Prof. Mlinsek replied that forestry has always been focused on ecological as well as economical issues. Without the demands of people for benefits from the forests there would also be no requirements for any management practices. On the other hand, if people demand benefits from the forests, then the need for tending the forests arises. The crucial point, which is the main responsibility of foresters, would be the selection of the appropriate practices with regard to the individual situation. Between the two extremes of total protection (quote: "Käseglockennaturschutz") on one hand, and ruthless exploitation on the other hand, he would favour an in-between solution which would stress keeping as many options for future generations as possible. One of these options might also be an increased need for quality timber; so abandoning timber production altogether might also deprive future generations of possible options.

Prof. Zimmermann stressed the role of his presented project as a base for further research, and explained that the chosen research design had been a compromise between scientific requirements and financial constraints. In order to obtain closer information on the representativity of the results, control questions will be included in the interviews intended for detailed studies in follow-up projects. By comparing these results, it will be possible to assess the appropriateness of the method.

Dr. Nilsen remarked critically on Prof. Mlinsek's notions that lowland methods could not be applied to mountainous areas. He especially referred to Prof. Mlinsek's arguments in favour of selective cutting and single tree removal as the appropriate harvest method in mountainous forests. His experiences from Norway and other Scandinavian countries have shown that with an appropriate adaptation in scale and application patterns, similar practices can be applied both in mountainous areas as well as in lowlands.

As an answer to a remark questioning the appropriateness of questionnaires as the right method to assess attitudes and opinions, Prof. Zimmermann conceded that the chosen method was one of many possible ones, and that the results of that study had to be regarded as opinion trends rather than accurate statements about, which group in society made which exact demand towards forestry. The study had to be seen as the beginning of research of that kind in Switzerland. The questionnaires had also included questions about the socio-economic categorisation of respondents, but these results had not yet been evaluated sufficiently for publication. He regarded the differentiation between public and private forest land owners to be less important for the study areas in Switzerland, since public ownership there amounted to 90%-95% of all forest land. Therefore, the private forest land is only of little relevance for the implementation of forest policies.

Dr. Nilsen asked whether Prof. Zimmermann thought that forestry should be oriented to the results of majority votes (quote: "50% plus one") rather than upon professional knowledge and personal responsibility.

To this Prof. Zimmermann replied that he considered it the responsibility of professionals to inform decision makers about the consequences of potential actions and to convince them of the option they considered best. Since, in Switzerland, in most cases the legislative and administrative bodies at the level of individual communities or the Cantons make the decisions relevant for forests, his studies had highly concentrated on the opinions within these groups. Foresters would have to consider it their responsibility to actively engage in public discussion.

Prof. Glück commented that he considered a 30% response rate to be within the usual frame of such studies. He further noted that the results Prof. Zimmermann had presented, had also been supported by other presentations and contributions during the conference. He then asked Prof. Zimmermann about the reactions of forest service members in Switzerland to these results.

Since the study was just finished shortly before this conference, the results had not been widely published, therefore not much reaction could be expected at this point, remarked Prof. Zimmermann. The reaction of the federal forest service, however, could be mentioned as positive, since it had resulted in the assignment of a follow-up project which would provide more detailed results. The rather negative attitude of the public towards forest roads, which had been one of the results, however was something the forest service had not been prepared to accept, and discussions had risen around this question. Following the example of the federal forest service Prof. Zimmermann said probably other forest agencies, especially at the Canton-level, might also show interest in more detailed follow-up studies.

Dr. Spinelli asked Prof. Mlinsek if he considered the choice of appropriate practices in forest management (quote: "What foresters should do and what they should not do?")

also to be a bioethical or merely a technical problem, referring also to the Slovenian example of prohibiting clear-cuts by law.

Prof. Mlinsek stressed that, on one hand, this practice (clear-cutting) was legally prohibited in his country, and on the other hand, this attitude was an integrative part of forestry education there. He went on further to stress that in his opinion, forestry should be considered an organic part of a country's culture, not just part of the economy.

Prof. Kennedy reported on a study in the US regarding foresters' perceptions about the public's expectations towards forestry in relation to their own expectations and values. The results had shown that the personal values of foresters were indeed quite close to those of the general public, but that their stated preferences as professionals differed from that. The problem here might be within the relationship between the forest administrations, on one hand, and the institutions responsible for funding (representatives of government and parliament at various administrative levels), on the other hand. In public discussion, foresters, who are used to technical discussions, stand little chance against environmentalists, who take their stand using emotional arguments and who actually express their feelings instead of shielding themselves with the use of jargon. He mentioned television as a medium, where passionate lines of argumentation, inforced by emotionally appealing images, are especially in advantage against cool, technical statements.

Prof. Vos inquired from Prof. Zimmermann, as to whether he had included any questions about people's willingness to pay into his study, since the results about preferred goods and services might differ if they are linked to financial effort by the prospective users.

To this Prof. Zimmermann replied that he, as well as the other participants, already had access to a large number of such studies, but that up to now, nobody had come up with an appropriate tool to use that information. Therefore he had abstained from posing these questions again in his new study. He had included, however, a question about, who the people thought should pay for amenity goods and services. The general answer to this question in the Swiss study had been that people considered the state to be responsible for this.

Prof. Solberg advised a dualistic approach in assessing the market value of new goods and services. In addition to the applied approach of willingness to pay, experiments should be performed where people are given the actual opportunity to pay for these products; thus, more interesting results might be derived.

Prof. Zimmermann emphasised that he had not wanted to underestimate the value of this sort of research, but that in his opinion there already was a sufficient amount of results from such studies.

Prof. Mlinsek accented the importance of observing nature and learning from these observations in order to obtain appropriate management procedures. Since nature is chaos, however, he stressed that people should not try to imitate chaos, but that a close-to-nature forestry basically consisted of the idea of adapting to the conditions encountered at the individual site. Thus, close-to-nature forestry would be not so much a technique, in that sense, than rather a philosophy evolving parallel to nature.

In a concluding remark, Prof. Koch stated that change was, after all, the essence of life. In contradiction to some remarks on Monday, he stressed that foresters were basi-

cally used to change, since they had been trained to see the forest as a constantly evolving and changing ecosystem; whereas the general public tended to have a more static notion of forests, regarding them as everlasting, never changing entities. Totalitarian approaches, regardless of which direction – exploitative or protective – were considered the reason for problems; whereas multi-dimensional, multi-functional approaches were seen as the way out of the crisis. Changes should thus be considered as new options.



SESSION III

THE ROLE OF FORESTS IN TRANSFORMING RURAL AREAS

CHANGING FOREST FUNCTIONS IN NEW EUROPE: FROM ALIENATION TO INVOLVEMENT

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ABSTRACT

The functions of NW European forests have changed considerably in historic times, always in response to market demand. Monofunctional stages have alternated with multi-functional ones for the benefit of broader groups of society. During the industrial era (mid-18th century, still surviving locally today), forests were merely monofunctionally oriented to distant markets and direct profits for owners or investors. As a consequence, forests became alienated from a large part of society and also from their surrounding landscapes. During the recent post-modern era, however, society demands "*à la carte*" a broad spectrum of different functions for industrial use, recreation, housing, nature conservation, environmental control, etc., for a growing urban population. If it is to be profitable, forest management has to deal with these new product-market combinations. This implies integrating forests better in urban society and in the broader planning processes, thereby transforming the alienation of society into involvement. This requires a pro-active market orientation in forest planning and research, instead of a reactionary attitude dominated by the wish to continue as before. Research may deliver adequate instruments for this, but not without a re-orientation to new research themes and a shift of disciplines and expertise.

Key words: forest history; forest functions; market orientation; alienation; forests in the landscape

1. INTRODUCTION

Forests deliver a magnificent scope of products, and therefore their value for society is unquestionably high. Moreover, forests continuously receive free publicity in the news media and are high on the political agenda. In contrast, however, the profits for forest owners and managers in NW Europe are mostly low. The question arises as to whether

forest managers are really focusing on profitable product-market combinations. Who wants what products, and do the forests deliver these? In NW European society, the forest's clients and decision makers are both urbanites. They constitute the real market, and demand a broad spectrum of products and services from forests which, until recently, were still merely oriented to mining (pit props) and the wood and paper industries. Many forests are alienated from a large part of present-day society and also from their surrounding landscapes. There must be a re-orientation towards involving society and integrating forests in the landscape, if forest development is to be sustainable, ecological and socio-economic. The consequences of such a re-orientation for forest policy, practice and research should be assessed and translated into action for the benefit of all involved.

2. COMPREHENSIVE HISTORY

The functions of NW European forests have changed considerably in historic times, always in response to market demand. Stages that were solely monofunctional have alternated with multifunctional stages oriented to broader groups of society.

2.1 Eras in history

A sequence of partially overlapping stages may be identified:

Natural/antique forest (from Neolithic times till early Medieval times): a wilderness, used as a lucky dip, for hunting, harvesting fruits and cutting firewood in accordance with the regulations laid down by the ruler. In many places around the Mediterranean – less so in NW Europe – forests were cleared and, as a result of this and subsequent overgrazing and burning, they degraded to heath, garrigue, maquis or bare rock. The wood was used for ship building, making utensils, firewood, etc. So much forest land had been cleared even before the time of Plato (429-348 B.C.) that he worried about the resulting erosion.

Medieval forest (from early Medieval times until the Renaissance): more directionally exploited under the guidance of nobility and clergy who had sole rights on extensive tracts to hunt (fur, hides, meat) and to extract timber and firewood. The forests had a specific value to farmers for fattening pigs, which led to conflict with forest owners. The perception of the forest as being hostile was strikingly illustrated by Dante Alighieri shortly after 1300 in the opening lines of the *Divina Commedia*: *Nel mezzo del cammin di nostra vita / mi ritrovai per una selva oscura / chè la diritta via era smarrita.* [Midway this way of life we're bound upon/ I woke to find myself in a dark wood/ Where the right road was wholly lost and gone. (Translation by Dorothy L. Sayers.)] Before Dante, around 1225, Francis of Assisi (1181-1226) symbolised the distance to divine nature by retreating in the mountain forest of La Verna, where he spoke with the animals. The Renaissance is frequently said to start with Francesco Petrarch (1304-1374), referring to his realistic description of nature as he observed it on his ascent of

the Mont Ventoux (1336). He termed the preceding period the centuries of *tenebrae* (darkness). From that moment on, Europeans approached nature in an increasingly functional and rational way. At present, the remnants of really virgin forests are small, scarce and dispersed over Europe (cf. Broekmeyer and Vos 1993). Old estate forests still survive, however, around castles and manors and old monasteries.

Traditional agricultural forest (from the Renaissance until today, locally): multifunctionally integrated in farm households, e.g. for forest grazing, charcoal burning, firewood, timber, manuring of arable land, and providing the material to make a range of items such as wooden shoes, baskets, barrels, brooms, etc. From late Medieval times onwards, a large part of the forests was gradually integrated into agricultural households, either as common property or rented. These integrated forestry-farming systems were regionally differentiated by a functional adaptation to climate, physiography and local cultures. In every case, the base was the “trinity” of trees – arable cultures – grazing, arranged at different spatial levels: the single tree (e.g. in *dehesas* and *montados*), land parcels (mixed cultures), farms (mixed farming), landscapes (e.g. altitudinal zones). Each tree in these landscapes was used by the farmers some way. In many regions of Europe this functional trinity controlled the landscapes for more than a millennium (cf. Le Coz 1990, Joffre et al. 1991, Vos and Stortelder 1992, Vos et al. 1994). These systems or their remnants still survive in various forms in many regions, but they are rapidly vanishing.

Industrial forest (from mid-18th (locally, mid-17th) until today, in many places): monofunctionally oriented to distant markets for the industrial use of timber, pale wood, tannins, etc. for the benefit of owners and investors. This required bulk biomass production, and the mediocre quality of the wood was not generally seen as being a problem. In the same functional and rational way, erosion-control forests were planted on vulnerable sites. These industrial stands replaced old mixed forests or were planted on wasteland (e.g. dunes) and less suitable grazing lands (e.g. heath) or fields, using “modern” techniques (fertilisation, tillage, selected exotic species, etc.). The same forest types arose everywhere, dispersed over the landscapes. In this stage of industrialisation, with its specialisation and division of labour, the forests became alienated from the major part of the surrounding society and, in many cases, from the landscape too.

Post-modern forest (recent): “*à la carte*”, a broad spectrum of production, information, regulation and pool functions for industrial use, as well as recreation, hous-

Figure 1. Simplified sequence of developmental stages of NW European forests

Stages	Main forces in society	Orientation	Functions	Access
natural/antique	nature, antique world	society-oriented	multiprofunctional	open
medieval	feudalism, church	owner-oriented	monofunctional	closed
agricultural	traditional agriculture	society-oriented	multiprofunctional	open
industrial	industrialisation	industrially orient.	monofunctional	closed
	neo-feudalism (estates)	owner-oriented	multiprofunctional	closed
post-modern	urbanised society	society-oriented	multiprofunctional	open
	modern agriculture	industrially orient.	monofunctional	closed
	nature conservation	nature-oriented	monofunctional	closed

ing, nature conservation and environmental control. Recently, many existing forests have been multifunctionally re-integrated into society, and new forests have been planted to meet new demands. This is especially true for urbanised areas, where land is scarce and there are multiple interests. Only locally are forests being re-integrated into multifunctional agriculture.

2.2 The urban interest

In all stages, except for those in which forests are integrated with subsistence agriculture, the demand from urban society was the main force behind forest exploitation. This is especially true for the industrial and post-modern stages that coincide with the ongoing urbanisation in NW Europe. But the urban impact is not that new; over time, most forest managers have represented urban interests (Küchli 1994). Most users are town people. Whether the products are fuel wood or charcoal for domestic use or for industry (e.g. iron making), timber for building houses and ships, long stems for construction piles and masts, pit props, plywood, pulp for paper, recreation forests and parks, and also nature and global life support functions.

2.3 Alienation and involvement

Apart from the “external market” emphasised thus far, all people who own any kind of means of production also have an “internal market” which may play an important role in their decisions. This is evident for the use of forest products in subsistence households, but certain imponderable functions for managers and owners should not be ignored, such as respect, personal/family identification with the land/estate, very long-term investments. The same may hold for the identification of broader groups in the surrounding society which may identify with the natural and cultural heritage of common goods or any other good belonging to “their” territory, even if it is owned by somebody else. As a consequence, the personal involvement of all people directly or indirectly engaged in making decisions about forest management is an important condition for the sustainability of the forests. As in agriculture, initiatives “born from within” frequently offer good prospects for sustainable management (cf. Van der Ploeg and Long eds. 1994).

In subsequent stages there seems to be an alternation of the intensity of involvement of local societies. At the moment, most industrial forests and their managers and owners in NW Europe constitute an individual spatial and functional unity, excluding the rest of society. The same holds for the recent forest reserves.

If our forests are to be sustainable, it is important to find proper ways to deal with the fact that a large part of the growing urban population and the progressively more specialised farmers have become alienated from the forest and that the foresters have become alienated from urban and agricultural society too.

At this precise moment in time, we are looking to the next millennium with trepidation; we suffer from a “kilophobia”. Periodic reactions to alienation from nature occur, like those that emerged in the previous *fin de siècle*. They may be recognised in the dif-

ferent ways nature is idealised in the arts, literature and philosophy (e.g. the landscape style in landscape architecture, some impressionists, Jugendstil/Art nouveau, organic architecture), and equally well in different “back-to-nature” movements in society, including their exaggerations and falsifications: living in garden cities, healthy eating, natural cures, organic agriculture, recreation in nature, nature conservation movements – even fighting for nature à la Greenpeace – but also less lofty phenomena such as retro-movements in fashion, gardening, etc. In reaction to the alienation of our cities from nature, many people yearn for nature; they want to encounter it and to be involved in safeguarding it and not be excluded – neither from managed nor from spontaneous forests.

2.4 Transition

At the moment, we are in the midst of a transition from the industrial stage towards the post-modern multifunctional stage, with characteristic shifts towards:

- a broader spectrum of different forest functions,
- a direct orientation towards urban needs,
- new production forestry being integrated in farm households,
- “naturalisation” of existing forests,
- isolation of natural forests from society through nature conservation,
- spatial differentiation of forests, adapting to the “new markets”,
- greater involvement of urban and rural society in the future of our forests.

Altogether, the direction is not all that uniform, but diverges “à la carte” for different functions (markets).

3. LANDSCAPE SETTING

3.1 Forest mosaics

Both the forest remnants from earlier stages and the new forests reflect their own cultural settings which may be functional (for agricultural households, industrial use, specific purposes like erosion control, shelter belts, town forests, recreation areas) and/or dominated by aesthetic or ethical fashion (formal Renaissance gardens, landscape style, nature reserves). In nearly every case, the position in the landscape, the forest lay-out, the forest structure, the species composition, etc. are characteristic of the period in question.

In subsequent stages the new arrangements superimposed the former ones, leaving remnants untouched, transforming other parts or replacing everything that previously existed. Hence, nowadays most of the forest complexes in NW European landscapes consist of complex mosaics with elements and structures differing in age, function and management strategy. Sometimes the remnants of former stages are reduced to single trees, hedges, road patterns or traces in soil profiles. Virgin forests are rare. Some rem-

nants of feudal estates and monastery forests survive; and in some landscapes, the structures of the traditional agricultural landscapes may still be reasonably intact.

3.2 Forests as alien elements in the landscape

Forests that have established themselves spontaneously are, by definition, characteristic landscape elements, as they have adapted to the physiography and history of the site and to quite different external influences as well (through groundwater, surface water, air, gene influx, etc.). Traditional agriculture gave forests a very characteristic location in the landscapes too. They developed as a photographic negative of agriculture. As a rule, forests remained on sites unsuitable, or at least marginal, for farming which does not mean that the role of forests was limited. On the contrary, in many traditional agricultural landscapes, forest products (timber, charcoal, firewood, game, mushrooms, fruits, etc.) were complementary to and sometimes more important than those of agriculture. Forestry activities were frequently, fully integrated in the farming systems, either in the farmers' activities or as a specialisation of a limited group (e.g. charcoal burners). As a result of being incorporated into farming systems and thereby acquiring a specific location and various external functions (economic and ecological), forests contributed to the characteristic spatial arrangements of these landscapes; they had "their own place".

Most NW European industrial forests, however, have been planted recently or intensively transformed. And they have rarely been functionally integrated in existing landscapes, rather are frequently undifferentiated, blanketing or usurping all former stages. If a landscape is defined as a characteristic spatial arrangement of ecosystems, the creation of the same type of even-aged forests with one dominant exotic tree species on very different sites inevitably causes a decline in the biotope diversity and quintessence of these landscapes. In this way, forests have become alienated from their landscape setting in many regions of NW Europe; they have become "alien elements" in the landscapes.

3.3 Forests integrated in the landscape

In many cases the new "*à la carte*" forests are much better integrated in the landscapes than their predecessors. As mentioned above, this is true of forests that develop spontaneously. But it is equally true for the well-planned recent forests that have been deliberately integrated in rural and urban spaces. Nature conservation and land abandonment are the main forces behind the spontaneous forests, whereas the multifunctional demands of rural and urban societies lie behind the new, planned forests.

New forests not only develop as a photographic negative of agriculture on the least suitable sites. They are also planted or develop spontaneously on the best agricultural and urban sites if the functional arguments from "the market" are strong enough. In urban zones there may be much demand for forests as parks and green belts. This is demonstrated, for example, by the new Dutch "polders", where the financial invest-

Figure 2. Increasing percentages of land for forests/nature and residential areas in the new Dutch polders (1930 – 1968).

	year of reclamation	area (ha)	forest & nature (%)	residential areas (%)
Wieringermeerpolder	1930	21.019	3	1
Noordoostpolder	1942	50.120	4,5	1
Oostelijk Flevoland	1957	54.000	11	8
Zuidelijk Flevoland	1968	43.000	25	18

ments in the land were extremely high due to the cost of the reclamation. From the 1930s to the 1960s, polders with larger percentages of land designated for forest and nature areas were created closer to existing urbanised zones. The figures show a strong correlation with the area under new housing, reflecting the new markets for forests.

One of the challenges in both landscape and forest planning is the re-integration of forests and plantations in the landscape. Criteria may be diverse: landscape-ecological (e.g. site suitability, integrated water management, ecological connectivity), economic (e.g. multi-purpose market orientation, favourable cost/benefit analysis, efficient integration in units managing urban green, nature conservation enterprises, forest enterprises, estates, recreation enterprises, farms, etc.), historical (dealing with historical elements and patterns) and social (e.g., considering amenity, involvement of users and managers). There is an apparent need for basic principles and methodologies for an integrated approach to the planning and management of new and old forests in the landscape.

4. NEW AND OLD FUNCTIONS

4.1 Many products, more functions

Over the years, forests have provided many different products and services to society. In several stages, their functions comprised a much broader spectrum than the set of products they were managed for; they fulfilled other external functions in addition to producing a limited number of marketable products. Indeed, all forests managed for only a limited number of marketable products had many other functions for society too: the ancient monastery forests and country estates as well as the industrial forest stands and the recent forest reserves. Their added value for other users has always been and still is a source of conflict between the owners and other people who wish to profit from them too (farmers with pigs; people collecting leaf mould, turf, timber or firewood; recreationists; nature conservationists promoting strict forest reserves or forest grazing; water companies diverting large amounts of clean water).

Figure 3. Main products and services in the subsequent stages of development of NW European forests

Stages	Main products and Services
natural forest	intrinsic value
antique forest	hunting, fruit, etc., firewood
Medieval forest	hunting (fur, meat, hides), fruit, etc., firewood
traditional agricultural forest	firewood, charcoal, building timber, materials for utensils, forest grazing, fodder, fruit, mushrooms, hunting
industrial forest	timber, wood bulk production (e.g. for pit props), quality timber production, Christmas trees, pulp, tannin production, recreation, hunting, erosion/run off control, watershed management, housing on estates, education and research
post-modern forest	timber, wood bulk production, quality timber production, Christmas trees, pulp, recreation, hunting, integrated watershed management (water purification, retention, erosion / run off control), energy production, nature, global life support functions (e.g. CO ₂ sequestration), housing, zoning, education and research

4.2 Typology of external functions

In order to be able to discuss the external forest functions adequately, these functions should be defined precisely, differentiating between:

1. the matter and energy regimes, the “working” of the system in its surroundings, defined by pools, feedback mechanisms and matter and energy outputs, from which three basic groups of functions may be derived: production functions (from matter/energy output), regulation functions (from feedback mechanisms), option functions (from pools of nutrients, water, genes, etc.);
2. the information regime, the “organisation” of the system that may be observed or measured by people, whereby forests may fulfil some information functions (from information resources).

The **production function** of forests and plantations yields traditional output such as crops, fodder, timber and other wood, biomass for pulp and energy, but also cork, tannin, resin, fruit, honey, mushrooms, aromatic plants, etc. – and of course oxygen.

The **option function** refers to the possibility of using stocks of any kind in the future: the gene pool, the site quality, the fresh groundwater, but also the space for future use. Sustainable management deals with the continuity or renewability of these pools.

The **regulation function** may extend far beyond the forests and plantations themselves, via purification of water, runoff/erosion control, slope stabilisation, climate control, purification of air, etc. It may even extend to global life support functions, such as

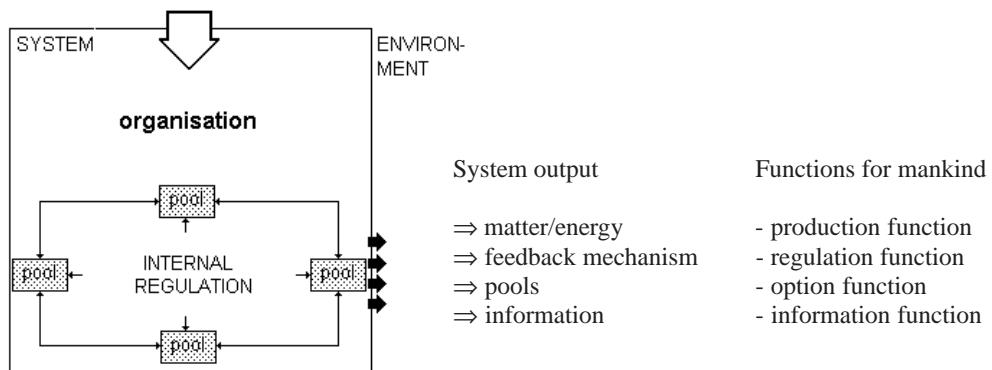


Figure 4. Simplified scheme of the external functions of a forest ecosystem:

sequestration of CO₂. Moreover, forests offer an infrastructure of different habitats, functioning as stepping stones, corridors, etc. for migrating animals, and as seed sources for forest plant species.

The **information function** refers to the order or disorder of the system and its components. The impact of forests, hedges and individual trees on the visual character of a region is obvious. But these components also contain information on wildlife biodiversity, forest history, the physical and chemical organisation of the system, etc.

4.3 New functions

In these quite different ways, forests have always contributed greatly to the characteristic spatial arrangements of landscapes. They have fulfilled all kinds of direct and indirect functions for society. However, the market demands a broad spectrum of production, information, regulation and option functions “à la carte” from the post-modern forests, including all manners of unexpected “new” functions, for the benefit of industry, recreation, housing, nature conservation and environmental control, etc. These challenges are facilitated by various factors such as the rapid changes taking place in agriculture that lead to land being abandoned and opportunities for new forests, and by technical innovations (lamination, construction technology) and the ability and willingness of NW European societies to pay for quality of life.

The changing “claims” from society can better be interpreted as opportunities – as new markets for forestry products and services, rather than threats. And who does the claiming? In our urbanised society, by far most of the clients and decision makers are urban: readers of books and magazines, conservationists, tourists and people with second homes, industrialists as well as policy makers – even scientists. They constitute the real market for forests. Which leads to the questions: Are our forests already producing what these people demand, and are the forest owners and managers able and willing to meet these demands?

4.4 Problems of multiple use: integration or segregation

The main problem raised by multi-purpose forestry is the incompatibility of different forest functions. One important question when dealing with this problem is that of the integration or segregation of forest functions. One type of integration may be segregation on a smaller scale (Helliwell 1987). However, the integration at a functional level is more basic. Whether this approach succeeds or fails depends on whether management regimes are able to deal in practice with the desired mix of functions on one site at the same time (Bos 1993). Incompatibilities may hamper the integration of forest functions, and may therefore be an argument for segregating functions in space or time. This may be achieved by zonation, which – in addition to having many advantages – also has several limitations (cf. Bos 1993).

The main advantages of zoning forest functions are that it enables better (i.e., clear, specific and effective) management decisions to be made, reduces land use conflicts, and improves the effectiveness of the communication of the actors involved (these include the general public). Some of the limitations of zonation are related to the broader context of certain environmental problems (some causes transcend the local area and some impacts are diffuse and transcend local boundaries), the amount of information needed to make a sound decision, and various practical physical, ecological and social options (acceptance).

In forest management, zoning does not mean prohibiting particular forest uses within certain zones; it refers to differences in management goals for different parts of the forest (e.g., Haas et al. 1987, Bos 1993). The question is therefore not so much either integration or zonation, but the best conceivable match in any way between the multiple set of forest functions and the demands of society, with the general rule being: zonation where necessary and integration where possible.

In fact, the incompatibility of forest products and services in urban forestry systems, agroforestry systems and mixed multifunctional forestry systems is mostly limited to certain mutually exclusive production functions. And there are, of course, all kinds of problems in reconciling the production and option, regulation and information functions. But, in practice, these are usually solved, often with the help of zonal planning instruments, such as land evaluation procedures (Laban ed. 1980) and computerised spatial optimisation techniques (Bos 1993) that adapt forests to the landscape settings, in combination with decision-making instruments for multi-purpose management.

5. NEW MARKETABILITIES

Although their value for society is unquestionably high and forests receive continuous free publicity in the news media and are high on the political agenda, the profits from forests in NW Europe are mostly low. This is largely because of the low prices paid for timber and the fact that for most forest functions no price is paid; there is no market price known for them. And in reality it is difficult to deal with them, as many “public goods” are characterised by (1) the impossibility of dividing their use among people (2) the impossibility of excluding people from the profits (e.g., purification of air and wa-

ter, biodiversity, contribution to the scenery, spatial buffers against urbanisation) (cf. Filius and Hekhuis 1995). All these arguments might be true; and what seems to remain is a technical discussion about the feasibility of assessing the intangible functions in monetary terms, subsidising, the compatibility of forest functions, etc. Most of these problems can be solved technically; there are many different methods for assessing the values of non-marketable forest services/products (Filius and Hekhuis 1995) and there are also all kinds of payment mechanisms.

More fundamental, however, is the attainment of profitable and manageable product-market combinations by tuning forest management to the real markets. If it is possible to achieve an added value that is sufficiently attractive for the solvent clients (authorities or private persons), then the payment mechanisms will definitely follow. An orientation to the real market is much more relevant than whether payment occurs directly, by subsidies, tax regulations or any other means.

An important question is, of course, which product-market combinations should be the core business of forest management today, and how they should be dealt with. They can only be identified if forests are better integrated in urban and rural societies. The alienation of society from the forest should be transformed into involvement, a more direct link. One of the conditions for this is better integration in the economic, spatial and environmental planning processes at different levels (local, regional, national, international). Nowadays, decisions about forest management, conservation and the establishment of new forests are frequently made by distant planners, ecologists, landscape architects, etc. without involving local society and without an adequate knowledge of local ecological, physical and socio-economic conditions. If forestry is to be positioned better, those who are the producers must be clearly segregated from those who constitute the market. In many cases, foresters adopt an attitude of "we know what is good for you", but actually mean that they know what is good for them.

Altogether, for forests to be more marketable, the attitude of those responsible for them should be pro-active, driven by the multiple demands of society and the value forests can add to these, and not so much by a reactionary attitude, dominated by the wish to go on producing as before. This transformation can only be achieved if both forests and foresters are flexible. Forest flexibility is considered to be the ability of old and new forests to adapt to new market demands within the constraints of ecological and socio-economic sustainability. Clearly, forest flexibility favours optimal multi-purpose benefits for future generations. The preconditions include safeguarding production, ensuring that site conditions continue to operate, and the existence of a socio-economic framework (Oesten 1994). Given the global environmental changes facing us, Oesten (1994) suggests adding the following criteria favouring natural sustainability to criteria like naturalness and rarity: the ability of forests to adapt to changing growing conditions, their buffering potential, ecological stability, their capacity for regeneration, avoidance of irreversible developments, and risk-spreading through structural diversity.

However, possibly at least equally important is the foresters' flexibility: their adaptability to new market demands. This ability seems to be the only possible way to transform the alienation of society from the forest into involvement, into a more direct link by achieving an added value that turns forests into marketable products. Therefore, all action and thinking should be oriented towards making forests into products that individuals and authorities find so attractive or important that they are willing to pay for

them which is the very best guarantee for the ecological and economic sustainability of forests.

6. THINGS TO BE DONE

Research should not only deliver instruments requested by forest planners and officials; there is also a need for proactive research which is directly linked with the different stages in policy cycles, such as:

Problem identification

- Identification and cost-benefit analyses of new product-market combinations.
- Analyses of discrepancies between demands and products (socio-economic, ecological).
- Scenario studies and *ex ante* evaluations of forest development and establishment.
- Life cycle analyses (carbon, chemical compounds) for the quantification of the sustainability concept.

Policy making

- Decision-support instruments at regional, national and international levels.
- Analyses of the compatibility of forest functions.
- Zonal planning instruments: basic principles for the integrated planning and management of rural and urban areas.

Implementation

- Promotion of involvement: marketing strategies, research support for initiatives born from within, criteria for timber certification.
- Management support instruments: forest flexibility/sustainability criteria, biodiversity criteria, the means for forest/site restoration, models of forest transformation and reference systems.
- Socio-economic and technical risk analyses of afforestation.

Evaluation

- Monitoring methods and networks in managed and unmanaged forests.
- *Ex post* evaluations of policy and management decisions.
- Chain control methods that promote an optimal production chain.

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SUSTAINABLE DEVELOPMENT IN RURAL AREAS

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*MULTIDIMENSIONALITY instead of one-dimensionality
SLOWNESS instead of fast acceleration
SELF-ORGANISATION instead of central power*

These are the three key demands made by the German physicist and futurologist Peter KAFKA, or as he puts it in his own words, “the true progress sustaining the world and mankind” – progress that should protect us from ecological and social decline and therefore ought to be the measure for all human action. This demand is currently embodied in the paradigm of “sustainability”.

Multidimensionality, slowness, and self-organisation are also the “virtues” that are still attributed to the rural areas as we see them today. Why do we not test whether this is only a common cliché or if rural areas are indeed operating along the principles of sustainability, as described above.

However, if this should not be the case at a satisfactory level – as one might guess – then one has to ask what can be done so that these 3 “pillars of sustainability” can take more effect in the future, particularly in rural areas.

1. MULTIDIMENSIONALITY INSTEAD OF ONE-DIMENSIONALITY

This demand should, on the one hand, be understood as a plea for diversity. Being different should not be looked upon as a deficiency meant to be levelled rather as a great chance, namely for each part with its own characteristics, as well as the whole. Diversity today stands for carrying capacity and is therefore a synonym for “fitness for the future”.

On the other hand, the slogan “multidimensionality instead of one-dimensionality” certainly includes an appreciation for smallness. Today more than ever – particularly in a spatial context – it stands for qualities such as control, directability, and security. Values which, in a world of increasing globalisation and complexity, are greatly endan-

gered. "Largeness of smallness" certainly means a relatively high capacity for adaption and buffering and is therefore an expression for stability.

To what degree can rural areas in Austria actually fulfil these qualifications? Let me give you a few statistics: Approximately 90% of the Austrian Federal territory is situated outside of urban agglomerations, and can therefore be called "rural". This dominant position in terms of area is also expressed in the communal statistics. Of the total of approx. 2.300 municipalities in Austria, 2.100 have less than 5.000 inhabitants; they are so-called "market towns" and villages, comprising 40% of Austria's population. These figures quantitatively reflect the remarkable position of rural areas and their populations in Austria. In addition, they also show the small-scale administrative structure on the local scale.

Naturally, these figures cannot characterise the variety of rural areas in Austria. Thus, for instance, the natural assets, the society, the cultural roots, the economic structure, and the position in relation to urban agglomerations determine the great variety of rural areas in Austria and consequently result in different development paths for each region. Even without looking at the details, we can certainly conclude that the criterion of diversity of rural areas is fulfilled as demanded by KAFKA.

More difficult to prove is the fact that "smallness" can indeed offer the above described virtues of control, directability, and security.

In general, one has to consider that due to improved transport and communication technologies, lower energy costs and the reduction of trade barriers, economies have meanwhile become highly interconnected. This means that in our state no area can avert the resulting increased interdependencies. Of particular interest in this context is the fact that globalisation was accompanied by a centralisation of economic activities. This, finally, means that – in a regional context – rural areas become increasingly dependent on agglomerations.

This loss of economic importance of rural areas has many aspects. One aspect is, for example, the enterprise structure with its low propensity for innovation and low-wage industries (Koblmüller 1995). Another is the mobility of labour from rural to urban areas forced by the scarcity of jobs. A third aspect is the thinning out of the supply of many urban areas with goods and services. This external dependence also expresses itself in tourism which is determined by the need for relaxation and the affluence of city dwellers. Respectively, life in rural areas is generally enabled – according to widely-held beliefs – by the dominating transfer of technology, goods, and services from urban to rural areas. Further, considering that a disastrous structural change has been taking place in agriculture since the 1960s, and the traditional economic, cultural and social 'backbone' of society is weakened; it is only obvious that in our country, particularly in rural areas, new approaches to economic activities are sought.

These efforts are strongly supported by the political model aspiring the assurance of sustainable development. The concept of sustainability, in general, aims to be a long-term and far-sighted principle, trying to keep human actions within the carrying capacity of ecological systems. Such a demanding program can only be implemented step by step, which – from a spatial point of view – is offered in the regional context.

Sustainable economic development within a region should therefore be supported by the following central pillars (Sustain 1994):

- Strong regional supply of needs, especially with food, sustainable energy resources and services;
- Close economic ties within a region so that, for example, substance cycles can be closed within a short distance and higher regional productivity can be sustained;
- Setting up of small and medium centres for economic linkages and traffic reduction;
- Orientation of economic ties with other regions along the principle of sustainability, for example external economic relations should be designed in such a way that they contribute to the strengthening of the regional stability of all areas involved.

It is obvious that the restructuring of regional economies according to these principles will open new opportunities, particularly for rural areas. It would enable them to decrease their external dependence on agglomerations and, at the same time, use their own resources (including human capital) more efficiently both on the intra- and the interregional levels.

Therefore, the large number of already existing regional and local economic projects has to be considered, frequently known as “endogenous regional development” or “village renewal”. These include: producer and consumer markets for the distribution of local agricultural produce, the production and use of alternative forms of energy within the region, initiatives for the promotion of eco-tourism and, last but not least, the creation of high-tech-industries or innovation centres in rural areas.

Although such projects are recommendable and successful in single cases, they must not divert attention from the basic problem, namely that the current understanding of economy with its paradigms of growth and globalisation also produces spatial utilisation patterns itself. They tend to increase the polarisation between agglomerated areas and that which is known as “what lies between”. From this perspective, the concept of sustainability always has to include key notions on the need for changing economic activity.

2. SLOWNESS INSTEAD OF FAST ACCELERATION

KAFKA's demand for slowness is also in opposition to current economic and social activity patterns. In the current system, the fulfilment of individual needs and short-term profit maximisation have the highest priorities. Only those will be successful who know how to take the opportunities “now and today”, and are constantly prepared for revisions and only take those chances which adhere to these principles. It is obvious that this system tends to accelerate itself.

The pressure of acceleration has both material and immaterial effects which seem to become more and more questionable. For example, energy and material input per unit of time have been increasing and still continue to increase in all phases of economic activity. The effects have meanwhile become well known: nature has not been able to deal with this turn-over and is steering towards ecological disaster.

The constant acceleration also shows its destructiveness by exposing mankind to a constant pressure to change and lack of time resulting in stress, tiredness, and illness. It even favours tendencies to dissolve traditional social structures seen in violence, disorientation, and a feeling of senselessness.

In terms of space, this trend of ever-increasing speed shows itself, on the one hand, in an enormous use of land within a short time. For example, in the fifty years after World War II, more natural areas were used for buildings and technical infrastructures than in the previous history of mankind. This sudden increase in technical infrastructure can – from a mere quantitative perspective – be seen as the “concrete” expression of an economic system oriented towards quick turnover. On the other hand, higher speed of transportation and the need to cover longer distances in shorter times are demanded. In peculiar accordance with popular demand, economic interest and political planning (in our country), the “restless society” has been created over decades (Wuppertal Institut 1995).

It is therefore not surprising that “slowness” is always equated with backwardness and economic failure. It was and still is easy to favour “acceleration” as the means of regional economic strengthening. This conclusion was also the favourite recipe for the development of rural areas. It was and still is an aim that centres can be reached quickly. These “acceleration programs” – aimed particularly at passenger-car traffic and thereby diverting huge sums of money to highway construction – did not reach their envisioned goal, on the contrary. Accelerated centre-periphery communication tended not to increase the attractiveness of rural areas as economic locations, much rather supported the spatial concentration of economic activities in the centres. The fact they were now within easy reach, in many cases, forced the functional “draining” of rural areas and consequently an increasing economic dependence on cities.

The ever-increasing flux of labour-commuting over longer distances into centres and the declining supply with goods and services in rural areas show this effect and are questionable not only from an economic but also from an ecological and social point of view .

From an understanding that under these conditions rural areas will ultimately always be the losers in this race, the concept of sustainability offers the solution of consciously avoiding this acceleration nonsense, especially in peripheral areas. It is aimed at the “deceleration” of economic activities and traffic in and from these areas. These “islands of slowness” do not equate the notion of growth with an increase in quantity rather in quality. In addition, the key issue of a sustainable traffic policy is the avoidance of traffic.

Both goals demand innovative solutions. Approaches for sustainable economic activities have been presented elsewhere. Therefore, let me briefly outline how approaches to a future sustainable traffic policy in rural areas should look:

- Creation of settlement and utilisation structures avoiding highways: this entails the “moving close together” of functions, particularly housing, work, and waste disposal; the avoidance of uncontrolled urban spread as well as the creation of small and medium-sized regional centres
- Discrimination of passenger-car traffic and promotion of public transportation, bike routes, and footpaths
- Promotion of telecommunication in rural areas

- Creation of mobility services for renting cars, organising car-sharing; providing information about junctions and providers as well as collective cabs and mini-buses
- Creation of logistic pools (Wuppertal Institut)

All in all, we have to come to grips with the fact that regional “slowness” is a virtue that has to be used carefully so it will not be diminished in the long run. Something already shows: the ones who are slow and among the last today will be the first under changed conditions tomorrow!

3. SELF-ORGANISATION INSTEAD OF CENTRAL POWER

It is obvious that along with the creeping loss of functions in rural areas, their socio-political position and representation of their demands in politics have diminished as well. We have to realise that rural areas have become unimportant to many people (Bund und Misereor 1996). All in all, this loss of importance favoured the transfer of decision-making responsibility away from these areas. Even here, when we pose the question regarding who is responsible for what, the control praised so widely does not exist anymore.

With this background, subsidiarity and self-organisation are key terms in the concept of securing sustainable development in order to reinforce the competence for local directability.

Subsidiarity means that the decision-making power should be located where the executive power is located and would therefore mean decentralisation. On the one hand, this would result in a high degree of identification with the content of this decision among the local population. On the other hand, this “downward” delegation back to the roots should result in a reflection of endogenous and traditional abilities. It can thus underscore the specific “regional, or local” strengths for certain projects.

It would only be a half-hearted approach if the simultaneous decentralisation of decision-making structures were not also changing the style of decision-making. Whenever the public interest is concerned, the decision-making process should be made transparent and a dialogue started with the people involved. Many citizens today feel excluded when they are not involved in the preparation of activities that will change their surroundings. Citizen participation also has the advantage that all people involved learn from each other. Often more optimal solutions than originally assumed are worked out together along the principles of sustainability.

Decentralisation in the service of sustainability does not only mean more say locally but also more willingness to participate in the sense of a maximum self-organisation of services available within a small-scale community (such as neighbourhood care for the elderly and children).

Under no circumstances, however, may the plea for more independence and responsibility be misinterpreted as an invitation to “idleness”. Contact with the “outside” is an important building block in this concept.

In conclusion, the key notion of sustainability also includes a strong immaterial component which should increasingly take effect in rural areas so that they can regain territory that has been lost to urban agglomerations. This can be affected by (Moser 1994):

- priority of education
- priority of identity-strengthening projects with high regional productivity
- opening up of decision-making processes
- no realisation of projects without broad local acceptance
- maintenance of internal and external dialogue

From the perspective of regional planning, we have to conclude that many of the presented ideas have been promoted by regional planning, itself, and related disciplines under the title of “provision” (in German “Vorsorge”) for a considerable time. However, these proposals have not been prominent in daily political life. Therefore, we can only hope that the political model of “sustainability” will now create the necessary broad basis for action that is “fit for the future”; action which also helps rural areas look towards a prosperous future!

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DISCUSSION 4

Wednesday, 11:00 - 11:30 AM

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SUMMARY OF THE DISCUSSION:

The main issues of the discussion were questions about the implementation of sustainability, in general, and how forestry could contribute here. The conflict between striving after sustainability and the constraints posed by economic forces were stressed by Prof. Weber, whereas Prof. Vos pointed out the necessity to accept diversity in all aspects of human life. From a research point of view the idea of performing scenario studies on the role of forestry under different socio-economic conditions in Europe was brought up and greeted by the participants.

Prof. Glück started the discussion by asking Prof. Weber, whether there was theoretical background behind Kafka's proposals, which she had presented and supported in her presentation, or if these were rather to be seen as a set of normative suggestions, based on certain values.

Prof. Weber answered that while theories existed supporting these ideas, the realisation of sustainability is a political problem; thus, political goals have to be identified. The way to sustainability, she added, consisted of small steps, to which everyone would have to add according to his field of expertise. Her own contribution, for example, was research concerning the development of sustainable settlements.

Two questions were then posed to Prof. Vos. The first one was whether he could devise a way to identify the new markets he had talked about in his presentation; the second one was about his ideas on how forestry should respond to the constantly fluctuating demands by the public.

In his response, Prof. Vos admitted the difficulties involved in assessing these demands and markets. He pointed to the presentation of Prof. Zimmermann, whose study had at least given information about the demands made by the public. In his opinion, it would be difficult to speculate about future demands, since ideas and public perceptions are fluctuating. The public should be given what they asked for at the present moment. Flexibility and the willingness to adapt were the virtues of main importance for foresters of the future. He himself was not able to give any recipes, since he presumed, there were no real recipes, just ways of thinking about and reacting to developments.

Mr. Bulfin commented on the specific problems of Ireland. Most of the participants, he stated, had come from countries with a forest cover between 20% to 30% or even more, in contrast to 8% of forest cover in Ireland. There was, however, a growing interest in forestry in Ireland. Within the past eight years the number of farmers interested in forestry had risen from a mere nothing to almost 10000, and that number was still increasing. In the future it would become more important to introduce the idea of multiple use and multi-dimensionality to Irish forestry, and he would like to hear advice on how to cope with this from the other participants of the conference.

Prof. Vos answered that he had no clear views on this, but that in his opinion, to encourage people to set initiatives themselves had proven the most successful approach in rural politics. This had been witnessed for example in introducing nature conservation programs for farmers in the Netherlands. Prof. Weber's presentation had also shown examples of this.

Prof. Weber confirmed this statement, stressing the importance of local initiatives. In Austria she had witnessed several successful examples for endogenous rural development. With relevance to forestry, she stressed the importance of encouraging not only timber production but also the production of wood products, within a region, especially high quality products like designer furniture instead of exporting the raw material. As another example for a possible contribution of forestry, she mentioned wood chip heating. To encourage people to stay in the region by providing them with opportunities was the main task in rural development.

Prof. Vos stated that the developments in today's society pose many problems for these initiatives from within. The predominant trend for centralisation and directive approaches present many obstacles for endogenous development, which have to be overcome in order to realise these ideas. In his opinion, today's societies lack the momentum of freedom necessary to encourage creative ideas, a freedom of thinking, which to his perception, could nowadays only be gained by engaging in experiments with drugs or excessive drinking, or which could be found in the arts. As an alternative to events like this conference, he would suggest a number of artists be assigned with the task of expressing their ideas about the role of forests and forestry. The results, he assured the auditorium, would be quite spectacular.

It was then stated that post-modern forestry might embrace all the different stages of forestry, which Prof. Vos mentioned in his paper, and further research on this topic was encouraged.

Prof. Vos replied that, in reality, a mosaic of different types of forest management would evolve according to people's choice. Diversity should thus be embraced.

Another query dealt with the notion of zonal specialisation and pertained to whether there were studies on this issue. It was also stated that rural development should not only be treated from a forestry viewpoint, but in order to define the contribution of forestry, it would also be necessary to link it with other disciplines.

Prof. Vos stressed the importance of simulation and scenario studies for political decisions. From Dutch experience, he observed that forestry and also nature conservation had not really been involved in simulation studies for regional development. The reason for this had been that these disciplines had not been capable of defining which developments they considered desirable. Foresters should have the courage to make predictions about the development of their branch with regards to the overall fu-

ture developments in Europe. He then reported about studies that had been performed running two scenarios. One had been an extrapolation of the existing trends, another had been a liberal market scenario where agriculture was simulated to be completely deregulated and opened to the impact of free markets. Under the second scenario, an abandonment of agriculture had been predicted for vast areas as a consequence. The implications for land use policies would have been enormous. Policy makers, he continued, were the market for such ideas and scenarios, and forestry should turn to them.

Prof. Weber then commented on a notion about the relationship between rural development and EU policies in this field. She expressed her scepticism about the role of the EU. After all, the EU is a predominantly economic organisation, which even if reformed, would have to adhere to today's economic rules. These rules though, were opposed to sustainable development. EU-subsidy programs for rural areas were but a small effort with small effects, compared to the mainstream development.

Prof. Haveraan then commented on the notion that small was beautiful, but too expensive. He asked whether it would be possible, under the present organisational circumstances, to arrive at solutions for this problem, or whether it was already too late.

Prof. Solberg agreed with the general direction of the presentations. The questions were: At which point the problems started, and which were the driving forces behind these developments? Differences exist between poor and rich regions in Europe. Some regions actually benefit from the present situation, so they would be quite opposed to changes. He welcomed Prof. Vos's suggestions to invite artists for inspirations, but input could also be gained from a large variety of other disciplines. Forestry was only one part of rural development, which could not be regarded out of the overall context. He then asked the two speakers about their suggestions for research needs and expressed his interest in the idea of running Europe-wide scenario studies as information for decision makers.

Prof. Vos said that it are the governments, who are responsible for implementing new policies, so they should lead the agenda here. To the remarks about the relationships between scale and cost, he replied that if the market demands were strong enough, expensive projects could also be realised. As an example for this, he mentioned afforestation programs in the Netherlands where new forests had been created on some of the most expensive land in Europe for the purpose of producing amenity values for the urban population there.

Prof. Weber stressed, that everyone was responsible for initialising sustainability in his/her immediate environment. Her institute had been involved in implementing "Islands of Sustainability" in some parts of Upper Austria. She considered this regional approach to be rather promising, nevertheless these bottom-up initiatives required support from top-down, and this was where the responsibility of politicians was asked for. To her the notion that small was beautiful but expensive, could only be upheld in an economy where externalities do not count. From this she concluded the need for economic rules, for a change of the economic imperatives of today.

Prof. Hyttinen remarked on Prof. Weber's demand for reducing the construction of new infrastructure, like highways, that in Finland the access to traffic infrastructure was seen as an indicator for regional development. He wanted to know what alternatives there were for the creation of employment opportunities in rural areas.

A participant from France remarked that it was easy to talk about principles and good intentions, but that the question had to be asked as to what the objectives of these principles were. It still remained to be proven, where the application of these ideas might lead to. Some of these ideas might not be sustainable at all.

Dr. Krieger expressed scepticism towards some of Prof. Weber's statements. She asked how high-tech development should be realised without the development of technical infrastructure. She also noted that self-organisation and local initiatives might not always show sustainable results. As a negative example for this, she pointed to the developments in and around her hometown "Zell am See", where tourism and traffic posed great problems.

Prof. Weber explained that the consequences of better traffic infrastructure, especially highways, had been miscalculated in the past. Instead of bringing jobs to rural areas, these connections had only attracted inhabitants of these areas to work in agglomeration areas, and the percentage of commuters had increased creating new problems. She also said that she was quite familiar with the situation in "Zell am See". There, people had wanted to increase their wealth by simply relying on one sector. But sustainable development required multi-dimensional approaches. On the other hand, it had to be admitted that, in many regions in Austria, tourism has succeeded in bringing wealth to the areas, and only through this agriculture has also been able to survive there.

Prof. Vos remarked that after the second World War, at least in Western Europe, there had been a broad consensus on the overall goals which then had consisted mainly in a quantitative increase of wealth. Only in Switzerland and Sweden, which had not been much affected by the consequences of the war, had there been a shift towards quality. Nowadays, there was growing uncertainty about future goals in Europe. People's attitudes were "floating", not sure of where to go. He perceived a sort of "Fin de Millenium"-feeling in Europe. The main force behind this was the success of liberalism. People demanded responsibility for their future, and governments should hand responsibility over, where this seemed necessary.

After this last remark, the conference was closed.

CLOSING COMMENTS

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“THERE IS NOTHING PERMANENT – EXCEPT CHANGE”.

These were the words of the Greek philosopher Heraclitus approximately 2500 years ago. The biggest challenge in our generation is that the world is changing at an accelerating rate as described by Alvin Toffler in his book “Future Shock” in 1970.

At this Conference you have been given insight into some of the changes that have or maybe will occur in forestry and in rural development in Europe. No doubt the changes in the future will be big and fast and difficult to foresee. This puts large demands on Forestry and on Forestry Research in the Context of Rural Development. COST Action E3 represents a unique European forum to give scientific and political synergy to solve the problems that we all are facing.

Thanks to the organiser of this Conference, Professor Peter Glück, and his excellent staff, we are now much better prepared to meet the challenges and to continue our work in the Working Groups.

FAREWELL ADDRESS

Prof. Glück concluded by commenting on the relevance of the sentence “*causarum rerum investigatio*” (lat.: “investigation of causes” – an inscription between the ceiling paintings in the conference hall) for the conference, since it expressed the main obligation of all scientists and had to be seen as an encouragement for future work. He closed the conference by thanking the speakers and the participants for their contributions in the sessions and discussions, and then expressed his gratitude to the persons involved in preparing and organising the event, with special regard to the colleagues from all institutions involved in Austrian Forestry, both public and private, who had cooperated here in an almost corporatistic way.



FIELD TRIPS

FIELD TRIP 1: MULTIPLE LAND-USE FORESTRY

FIELD TRIP 2: FARM FORESTRY

FIELD TRIP 3: MOUNTAINOUS FORESTRY

FIELD TRIP 1: MULTIPLE LAND-USE FORESTRY

Giulia Ruol

This excursion was designed to illustrate multifunctional management possibilities for forests. The Monastery of Klosterneuburg provides a good example of a privately (church) owned forest in which timber management, water procurement, recreational activities, sport, hunting and fishing coexist.

The area is made of 7800 hectares, divided into 10 districts and with 15 employees who are devoted to work in the forestry sector. The leader of the field trip was **Dipl.Ing. Hubertus Fladl**, business manager of Klosterneuburg.

1. MULTIFUNCTIONAL MANAGEMENT OF THE FOREST OF KLOSTERNEUBURG

Forest resources are becoming considered a source of renewable products. In the meantime however, forests continue to provide the hydrological equilibrium of the region, in addition to recreational opportunities in a natural woodland setting. The utility of the forests was recognised following society's cultural evolution. The initial function of production was primarily wood. This function changed as it was recognised that forests were important for other reasons such as hydrological protection, recreation, tourism and ecology. Today it is possible to value all aspects of the forest, not only timber production. The fundamental concept of current management is the **multifunctional forest**. The property of the Monastery of Klosterneuburg represents a model of this type of multifunctional management.

Up to the Middle Ages, the forest of Klosterneuburg was utilised for its **function of production**. The forest was used as a source of roundwood, fuelwood, secondary products, other materials, as well as for hunting, fishing and grazing. At one time, the woods and all these products were used by the Monastery for its economy. Today, a productive function more specialised in roundwood has been assumed with an annual felling rate of 27.000-34.000 m³. In contrast to this fact, now the other functions, such as recreation, are becoming more important.

At the time when the territory became settled, there was need to resolve the problems of hydrogeologically defending the region. The forest of Klosterneuburg became known for the **function of protection** especially with regard to the protection of the banks along the Danube.

As the population increased, resolving the problem of delivering drinking water to the near by inhabitants of Vienna become increasingly important. In Austria, the Monastery of Klosterneuburg as owner holds the property rights of all the water resources in its region. Today, the water for the city of Vienna is imported from Steiermark, but if water conditioning was introduced, the Monastery of Klosterneuburg could provide for itself. Now, the Monastery provides for the procurement of water supplies for the town of Klosterneuburg. Moreover, it receives income from rights-of-traversing charges, underground and overground (e.g., gas and water pipelines, telecommunications cable and telephone line, power lines).

During this century, the growth of tourism and concern for the environment have, firstly, introduced the idea of providing a quality woodland landscape for recreational purposes (**aesthetic and recreational function**), and secondly, for the conservation of woodland ecosystems (**ecological function**).

In regard to the landscape of the forest of Klosterneuburg, it has always had fundamental role in history and art culture of the region. The forest of Klosterneuburg was representative of the power of the Church; and because of this, the woods were conserved.

The landscape function of the forest is closely related to recreation: tourist function of the forest.

The property has remained intact through the centuries, and this has, no doubt, increased its value in terms of tourism. When examining the cultural history that the site provides, it is evident that the forest represents a large tourist attraction.

As a consequence of this, the Monastery has recognised the new ways in which the forest can be used for tourism and has introduced picnic areas, play areas for children, sporting activities such as mountain-biking and horseback-riding, as well as footpaths with views of the landscape, such as those along the banks of the Danube.

One firm, "Biotope & Co.", has used the river for a demonstration: creating natural, self-cleaning swimming pools with water plants in a natural area. This is a good example of how to create a real market using the resources of the environment and at the same time protecting them.

In regard to the conservation of the natural ecosystem, which is present on the banks of the Danube, this is an important factor in the policy evaluation of environmental goods.

It should also be recognised that the quality of the site is enhanced in terms of tourist potential through the provision of infrastructure such as roads which, in any case, are needed for timber production.

The area is known for its old tradition of wine production. This product is valued for its quality and therefore is an additional attraction for tourists. There is a direct relationship between the traditional wine production and the new tourist market in the region.

2. CONCLUSION

Having examined the different functions of the forest of Klosterneuburg, one consideration will be made. The primary production function has meant that there has always been a market for timber; however, in more recent times the other functions of the forest-tourism, recreation and landscape appreciation, amongst others have created a more diverse market.

The forest of Klosterneuburg has exploited these markets and provides an excellent example for others seeking to manage woodlands under a multifunctional land-use objective.

FIELD TRIP 2: FARM FORESTRY

Christoph Wildburger

Due to the fact that about 43% of the Austrian forests belong to owners of less than 200 hectares (mainly farmers, whose main enterprise is not forestry), the goal of the field trip was to show the significance of these forest structures in Austria. The role of these so-called “farm forests” for rural development, and the possibilities of the owners to receive additional income from the management of their forests should be discussed.

Since farm forestry is an important factor in rural development of Upper Austria – 51% of its forested landscape is managed on a small scale by farmers – the author led the excursion to the community of Windhaag, where Dr. P. Kar¹ and his colleagues from the Chamber of Agriculture of Upper Austria explained the situation, showed typical structures of farm forests, types of management and the influence of extension services.

To get an impression of the cultural background of the area, the tour was started in the village of Kefermarkt with a visit of a famous wooden altar, carved by an unknown artist in the 15th century. After this first stop, Dr. Kar gave an introduction to the situation:

CHARACTERISTICS OF FORESTRY IN THE REGION²

- The forest ownership structure is characterised by a high number of woodland farmers. They are assisted by forest agencies in improving the forest management to raise the benefit from their forests through additional income from timber products.
- Information, training, demonstration forests, co-operative organisation, and special consulting are measures which support them.

¹ Dr. Peter Kar, Chamber of Agriculture for Upper Austria. Forest Division, Auf der Gugl 3, A-4021 Linz

² For detailed data about forests and forestry in Upper Austria, see field trip guide.

- The main species of the area is Norway spruce (*Picea abies*), the natural composition of the stands is spruce – beech (*Fagus sylvatica*) – fir (*Abies alba*). Sites are mostly on coarse granites; the soils are poor in calcium and therefore sensitive to acidification.
- Traditionally, forests mainly served as a support for breeding cattle, leaf debris was collected, and clear-cutting was the usual method to get timber if needed; later spruce was patronised and was also the only species afforested.
- The results were soil degradations and changes in the composition of tree species in the forest. Natural beech-fir-spruce associations turned into secondary pine forests (*Pinus sylvatica*) or, if spruce was planted, into pure *Picea abies* stands.
- Supported by extension service and subsidies, administered by the Chamber of Agriculture, activities towards an improvement started.

Two example sites showing new management practices and the results of these activities, were visited:

Site 1 – Conversion of secondary pine stands

Due to consulting, the composition of tree species could be changed to a quite natural state; the amelioration of the site was successful. Generally, as this example shows, an essential improvement in forest conditions could be reached; and the volume of growing timber increased remarkably, too.

However, fir as a natural species is not regenerating. The influence of ungulate game is the main factor preventing a reasonable silvicultural management of *Abies alba*. In this area, mainly browsing of roe deer (*Capreolus capreolus*) restrains the growth of fir.

In this context, the forest-game interface and hunting as factor in the income of forest owners were discussed. Why farmers sell hunting rights, if their benefit from it is often lower than the following damage in value of the forests, could not be satisfactorily answered. Short term calculation which doesn't take into account long term losses, may be one reason.

Following lunch, the forest museum in Windhagen was visited. It gives an introduction to forest ecosystems, explains forest management measures and shows traditional living forms.

The question whether farmers can benefit from projects like the museum or other additional non-timber products of their forests (especially as a cooperative of forest owners), was discussed. The local foresters were sceptical about these possibilities because of cultural (“tradition would have to be changed”) and economic (“no market”) reasons.

Site 2 – Reafforestation of agricultural land

The motives for new afforestation have been poor yields and difficult working conditions. The concerned areas are often dislocated from the farms, too. Additionally, employment in farms has declined considerably.

In order to improve income conditions, afforestation of marginal yield areas was supported by subsidies, consulting, extension services and other measures (e.g. supply with saplings).

These afforested stands show a very high growing rate; the forests are very productive; and farmers get a rather high benefit from them.

However, this trend has stopped now, and most of the farms are planning no further afforestation. They are keeping the remaining areas as range land. Additionally, new legal regulations try to maintain traditional landscapes and management practices.

Conclusively, the representatives of the Chamber explained recent goals and activities. Their measures now focus on young growth tending and thinning (as a consequence of a lack of tending management in farm forests), increasing the quota of mixed stands with a rather natural composition of species, and soil improvement operations.

FIELD TRIP 3: MOUNTAINOUS FORESTRY

Gerhard Weiss

This excursion illustrated the significance of protective forests in Austria. The destination of the trip was a watershed management project in the Styrian part of the “Salzkammergut”. The Austrian program for securing protection forests was presented and discussed at the protection forest Sonnwendkogel in Assach, Styria, and the “ban forest” of Hallstatt, Upper Austria. The leader of the field trip, Dr. A. Pitterle, Institute of Silviculture, Universität für Bodenkultur, was assisted by Dipl.Ing. G. Weiss, Institute of Forest Socioeconomics, Universität für Bodenkultur, Dipl.Ing. W. Urban, Provincial Forest Authority of Salzburg, Dipl.Ing. A. Holzinger, Provincial Forest Authority of Styria and Dr. W. Schrempf, District Forest Office, Stainach.

1. THE AUSTRIAN PROGRAM FOR SECURING THE PROTECTIVE FUNCTIONS OF MOUNTAINOUS FORESTS

The Austrian Forest Law defines the terms “protection forest” (Schutzwald) and “ban forest” (Bannwald) as follows:

Protection forests

Protection forests according to Forest Law are forests on easily erodable sites which, therefore, need adequate management. These “protected forests” do not necessarily carry out direct protection functions for human settlements or activities. The law obliges the forest owner to maintain the forest. As far as measures to preserve the forest are covered by timber yields, the forest owner has to bear the costs. Yet, this regulation is of no great significance, since revenues from mountainous forests are rather small.

Today, at many sites in Austria where protection forests also directly protect buildings or traffic routes, the maintenance of the protective functions is endangered due to

lack of regeneration. Natural regeneration is frequently hindered by grazing use of the forest or by overpopulation of game for hunting purposes.

Ban forests

Forests that carry out a protective function are to be “banned” – i.e., regulated by the forest authority if public interest proves to be more important than the disadvantages for the forest management (forest owner). To ensure the objective (protective function) the authority has to prescribe measures, e.g., a certain treatment of the forest. The forest owner has a claim to compensation from the beneficiary of the arrangement. Only few declared “ban forests” exist, mostly originating from old ban decrees. The regulations are hardly implemented, because the beneficiaries refuse to accept the obligation to pay. As a result, forests that meet this definition, and are in bad shape, are ameliorated by means of public funds.

Two different funds are available for the purpose of securing and enhancing the protective functions of these forests:

Subsidies according to the Forest Law for high elevation afforestation and amelioration of protection forests (land reclamation projects).

This program is administered by the forest authority which usually administers the projects. Measures often are necessary in over-aged forests lacking regeneration. Subsidised costs comprise road construction, fencing against game or cattle, afforestation, tending and harvesting. These subsidies have been available since 1972. In the period between 1972 and 1994, a sum of 860 Million ATS was spent for 453 projects, equaling a treated area of 60 000 hectares.

Subsidies from the catastrophe fund for joint projects of the forest authorities and the forest-technical services in protective forests (watershed management projects)

This program is similar to the above, but granting of money is restricted to forests situated in the catchment basins of torrents or avalanches, respectively, forests that carry out direct protective functions. Precondition for the grant is high priority indicated by the Protection Forest Plans. These subsidies have been granted since 1985. In the period between 1985 and 1994, 240 projects with expenses of 920 Million ATS were subsidised in course of this program.

In 1994, a total of 477 Million ATS were invested for silvicultural and technical measures in protection forests with a subsidy share of 400 Million or 84% on an average.

2. THE PROTECTION FOREST SONNWENDKOGEL

These forest stands are on a highly erodible site. Erosion is in progress but may be stopped by permanent plant cover. Yet, maintenance of soil protection is not secured. Range uses in former times have degraded the site. The trees are over-aged; and due to overpopulation of game at the site, the forest lacks regeneration. In the course of an

amelioration project led by the forest authority, integrated measures have been planned to ensure regrowth of the forest, including forest road construction, felling of trees, planting of stabilising tree species, fertilisation, fencing against game and grazing cattle, separation of range and forest area, and measures of game management. Technical and silvicultural measures at an amount of roughly 1 Million ATS each are projected for a forest area of 30 hectares. These 2 Million ATS shall be spent over 10 years.

The overall objective of the project is to maintain the forest area. There is no direct protection function for human settlements. In the discussion, we learned that there is a confrontation between the forest authority and the forest-technical service for torrents and avalanches prevention regarding whether there is public interest in maintaining this forest with money from the catastrophe fund. The argument of the forest-technical service is that the money should be directed to those places where there are the most benefits to the public. These priority areas are situated where the forests directly fulfil protective services for settlements or traffic routes. The different viewpoints have been integrated in protection forest plans worked out jointly by the two authorities. Further discussion also revealed that the measures wouldn't be necessary if the concentration of game on the site had not made natural regeneration of the forest impossible in the past.

3. THE BAN FOREST OF HALLSTATT

A short stop at Hallstatt (in the Upper Austrian part of the Salzkammergut) showed another example of a protective forest. The ban forest of Hallstatt covers the steep slopes above the city directly protecting the settlement and roads against avalanches and rock fall. On this site, mediaeval forest exploitation for the purpose of salt-mining only left behind beech trees, a species that has very low capacity to protect against avalanches. In addition, deer hindered the necessary regeneration of fir; so extremely expensive technical measures had to be taken to protect the city (half a billion ATS since 1945 for an area of 300 hectares of forest). Regulation of the game population has not been possible because of the politically strong lobby of hunters. The main part of the subsidies for the technical measures are borne by the federal state and the province. The protected city and the road administration only contribute a small share of the costs.

4. CONCLUSION

These examples showed that due to historical and present-day uses, maintenance of the forest is often endangered. The economic situation of forestry in mountainous sites is poor. Grazing and hunting interests politically are often stronger than the interests of forest maintenance, so public investments are necessary to ensure forest regeneration. The forest authority and the forest-technical service for torrents and avalanches prevention have developed a scheme for indicating high priority sites to which subsidies should be directed. Criteria for this scheme are destabilisation of the forest ecosystem and local demand for protecting human facilities.

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