Public perception and attitudes of forest owners towards forest in Europe

Perception publique et attitudes des propriétaires envers la forêt en Europe

Edited by : Daniel Terrasson

Commentaires et synthèses du groupe de travail COST E3 - WG1 1994-1998

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Appendix

Introduction

This book gathers the comments and syntheses presented by the « Public perception and attitudes of farmers and forest owners » working group. This working group was operational from 1994 to 1998 in the framework of the European cooperation program in the area of scientific and technical research (COST E3) on « forest in the rural development context », thanks to some European Community funding. The quality of the work produced is largely due to the dynamism of Niels Elers KOCH, who chaired this working group during its first two years of operation, while also being in charge of COST E3 general coordination.

The goal of this group was to review the research projects undertaken on this topic in Europe, and then to encourage their development through a network of laboratories. The projects took place in three steps.

First, the goal was to list recent or ongoing research projects in the various countries of the Community. This project as a whole is not described here, but a few essential elements of C.H.JAKOBSEN and N.E.KOCH's global analysis are mentioned in the final synthesis article. A more detailed report, which includes a synthetic description of the identified projects and a few questionnaire examples, was distributed to the working group members. Their names are listed in the appendix.

Then, the working group tried to understand the commonalities and differences between the concepts and methodologies used. The goal was, on the one hand, to check whether the results were comparable from one country to another and, on the other hand, to think of a way to develop common methodologies.

This book gathers the research projects that have been selected in this framework. In all articles, the methodologies used have been particularly stressed. The results given are above all used as illustrations, and the goal of this book is not to synthesize them. On the other hand, we have gathered complementary approaches which belong to different fields (sociology, human geography, Environmental Economics,...), on different scales (from local to national), and which concern various questions, from the identification of preferences to economic assessment of non commercial goods. Given the breadth of the covered area, these presentations do not exhaust the diversity of all methodologies used, but the reader will find examples of scientific approaches which are useful to answer a number of questions about the public perception and the owners' attitude towards the forest.

In addition, it appeared during the discussions that a number of research projects harboured a confusion between the notions of perception and attitude.

It seemed therefore useful to add, at the beginning of the book, an article by H.BOERWINKEL who tries to clarify these concepts by using an example that does not belong to the forest context : conflicts between fishermen and surfers on the littoral.

The first part of this book deals first and foremost with the public perception of the forest, while the second part gathers texts on the attitudes of forest owners. Such a split is somewhat arbitrary, as some of the approaches deal with these two topics.

The working group then tried to identify the gaps of the European research system in this field, and to propose a number of priority research axes. This is the object of the third part, which is made of two articles. The first one was written by Thomas O'LEARY and offers a few leads in the area of public perception. The second one tries to synthesize the discussions of the working group.

Daniel TERRASSON
President of the working group

Part I

Public perception towards forest and forestry

Perceptions and attitudes in environmental transactions considered as appropriation components

Perceptions et attitudes considérées comme des éléments d'appropriation dans les transactions environnementales

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Abstract: *The concepts of perception and attitude are interpreted as referring to the same relationship between a person and an environment which is conceived as appropriation, with different accentuations of the sensory and the behavioral side of this relationship, and an accordingly different particular connection with the perspective of actor groups in the field of forestry. Perception focuses on the cognitive, emotional and motivational processing of environmental images, as important determinants of the relationship between forests and their recreationial visitors. Attitudes focus on the cognitive, emotional and motivational processing of aims, which are especially relevant for forest owners and managers. Examples of studies with a scale for the assessment of appropriation demonstrate the presence of perceptual and attitudinal components of appropriation in one and the same person-environment relationship.*

Résumé : Dans une relation entre une personne et son environnement, conçue comme une appropriation, les concepts de perception et d'attitude se réfèrent à une accentuation différente des aspects sensoriels et comportementaux de cette relation, et en conséquence à des liens spécifiques différents avec les perspectives de groupes d'acteurs. La perception est centrée sur les aspects cognitifs, émotionnels et motivationnels de la construction des images environnementales qui sont des déterminants importants de la relation entre la forêt et ses visiteurs. Les attitudes sont centrées sur les aspects cognitifs, émotionnels et motivationnels dans la construction des objectifs, qui sont particulièrement pertinents pour les propriétaires et les gestionnaires. Des exemples d'études avec une échelle d'évaluation du degré d'appropriation montrent la présence des composants dans une seule et même relation personne-environnement.

Introduction

The increasing concern for the environment and for the preservation of natural and landscape values has created a particular interest of policy makers in perceptions and attitudes of the public in general and of those who have a share in the direct control of those values, such as land owners and managers. The development of insights in these perceptions and attitudes may, therefore, profit from the analysis of the way perceptions of, and attitudes towards, the environment are anchored in the psycho-social dynamic people in general and the special control groups are involved in.

The concept 'perception' is defined in the 'Dictionary of the social sciences' (Gould and Kolb 1964, citing Hartley and Hartley 1952), as 'the process by which we register what is in the field of view in a way that is meaningful'.

In the same dictionary the concept 'attitude' is defined, citing Krech and Crutchfield (1948), as 'an enduring organisation of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world'. More recent definitions of these concepts do not depart fundamentally from the older ones.

In this attitude definition perception is included, indicating a certain intrinsic role of perception in relation with attitudes. On the other hand, the definition of perception as perceiving 'in a way that is meaningful' also suggests the importance of motivational, and therefore attitudinal aspects for perception. Experiments and real life experiences demonstrate that we often perceive 'selectively' what we want, because of a conditioned relationship with a person or an object (Gleitman 1981, or any other introductory handbook on psychology). We also build our attitudes, and change them, on the basis of what we perceive. Keeping this relationship between the two concepts in mind there is yet reason to differentiate the two concepts, for both practical and theoretical reasons.

A practical example is the following. Both recreationists and non-recreationists, as much as land owners/managers, have landscape perceptions and landscape attitudes. In recreation, however, the experiential transaction is more important than the aim one has with a landscape. It is, therefore, obvious, to put more stress on perception when recreation is at stake.The reverse is true in the case of landscape attitudes. In that case the aim character for the landscape owner/manager is more important and should be stressed.

For non recreationists accentuation of both landscape perception and landscape attitude may be required. Next to the possibility of experiencing the landscape the possibility, and even requirement, of acting responsibly with the landscape as a common good (resource for timber, natural values, environmental values) may be focused upon.

It is, therefore, the social context of the research approach that indicates the specific scope on either perception, or attitude, or both.

Landscape perception may then be defined as the cognitive, emotional and motivational processing of sensory registrations of a landscape in the context in which it is located socially, and spatially. Landscape perception puts the landscape in a primary experiential transaction context.

Landscape attitude is the organisation of cognitive, emotional, and motivational aspects of behaviour towards the landscape, on the basis of certain personal, or shared aims. Landscape attitude puts the landscape in a primary behavioural transaction context.

These definitions and mutual relationships are schematised in figure 1.

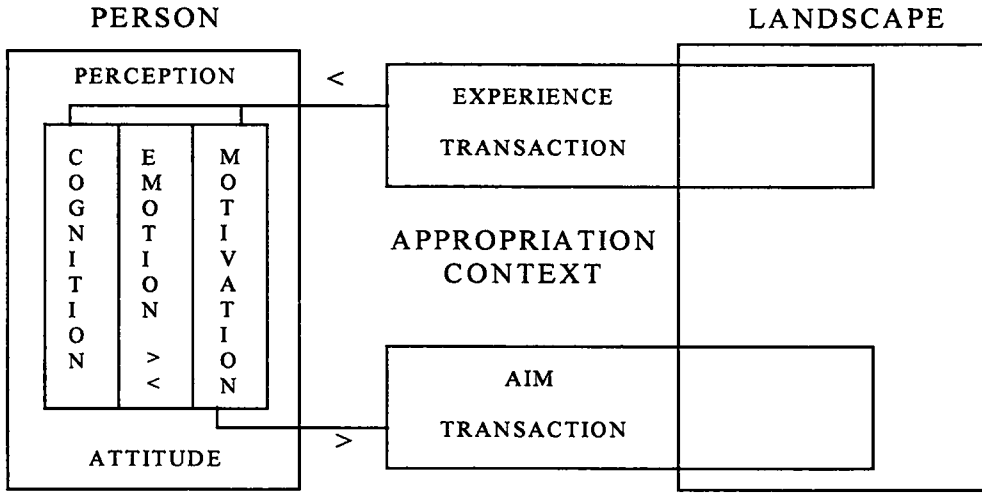

Figure 1: The conceptual relationship between landscape perception and landscape attitude in the context of experience transactions and aim transactions

1. Perception and attitude as two sides of appropriation

From a general psychological point of view perceptions and attitudes can be considered as two sides of appropriation transactions. Appropriation can, according to Chombart de Lauwe (1976) be differentiated into four basic categories, namely [1] the ability to 'modify' and 'use', [2] the ability to 'act more or less freely' and exert 'dominance' in cases of 'conflict', [3] 'aesthetics', and [4] the ability to experience the environment as 'symbol-bearer, according to a hierarchy of values'. In each of

these categories a perceptual side (input) can now be differentiated from an attitudinal side (output). This may be demonstrated with the following example of forest owners and recreational visitors of a forest.

One forester may perceive a forest stand as being in a good condition to be harvested, and accordingly have a supportive attitude towards governmental subsidising measures. A recreational visitor may equally support subsidising, because otherwise the forest may disappear altogether because of more profitable exploitation of land, such as for housing and industry.

Another forester may perceive the forest as the heritage of the family at large for centuries and feel that subsidising, because of certain required conditions by the authorities, is restricting his freedom of action and decisional dominance too much. A recreational visitor may feel that subsidising is rather conducive for his free action, as it keeps the owner at a distance from considerations of profit, so that recreational values may be observed more easily.

The concern for the attitudes of forest owners and the public towards forests is for a large, maybe even the largest part, connected with changes in basic value systems. While the public in western countries has developed a certain anxiety about rapidly disappearing forests, and/or the ecological values contained in it, the forest owner appears to be still captivated to a considerable extent in a more rationalised view of balancing different functions of which profit, or economic sustainability, is a dominant one.

This attitude prevails especially amongst the owners and managers of large forest estates. But for small forest owners an attitude of utility maximisation, rather than profit maximisation, prevails (Van der Ploeg and Wiersum 1996). In terms of Ellul (1979) one could say that the owner is as much immersed in 'la technique' as the public is already trying to escape from it, and is trying to find a -concrete or symbolic- refuge in the forest, and in nature in general. Of course, forest owners and the general public are to a large extent part of one and the same cultural change dynamic. As Boerwinkel et al. (1996) have demonstrated, the course of changes in basic cultural attitudes among (Dutch) designers of outdoor recreation areas is a -measurable- derivative of the general course of cultural change in society at large. The basic dimension of this long-term cultural change for our present cultural situation, as several authors (e.g. Habermas 1976, Lemaire 1976, Van Peursen 1985) have argued, is connected with the change from a predominant rationalisation to an ethical and fundamentally critical reflection on that. Boerwinkel (1986a) foresaw in this context, against a predominant 'techocentrism', the development of a 'biocentrism' that puts 'life in oneself, in other people, and in nature' at the centre of judgement criteria for what are viable solutions of major social problems.

To turn again to forestry, this very change of basic cultural attitude should be expected also among forest owners, as it has already happened to the public at large, and to specific expert groups.

An assessment of changing attitudes in forest owners, comparable with those of the changing attitudes of designers of outdoor recreation projects, and of philosophers on educational aspects of children's' playgrounds, such as performed by Boerwinkel et al. (1996) ought to result in a similar pattern of changing basic cultural attitudes.

2. The anchoring of forest attitudes in justice judments

As to the attitudes of forest owners towards changing forest management objectives an important criterion that derives directly from the basic cultural attitude dynamic is the judgement of the justice of outcomes 'for the self, for other interest groups, and for nature'. In the technocentric context of rational forest management for forest owners who depend economicly on their property, the predominant self-centred notion is that a forest should yield as much profit as possible. Efficient management is aimed at achieving that. If the question of justice of a fair share of all interests does come up at all, the 'interest' of nature is most probably reduced to a preservation of vitality of forest elements that have a central role in performing the timber and other harvesting functions. Other, more human, interests, such as recreation, or the interest of the public in general, will be put in a just treatment model in so far as a profitable economic function of the forest is considered to be good for everybody's subsistence, for the gross national product. In this technocentric context the recreation function can only be justified by a rational balancing of benefits and costs, strongly connected with the notion of retribution.

In a biocentric context, the notion of justice will be operative in quite a different way. Even if the economic appropriation value (i.e. Chombart de Lauwe's 'modification and use'), is for the forest owner still a viable one, other values (such as are implied in the other three appropriation categories: 'free action and dominance', 'aesthetics', and 'symbolism') may have an equal, or at least a genuinely greater influence on management decisions of the forest owner (cf. the examples given above). Also, the recognition of these four categories as legitimate appropriation properties of the forest for other interest groups, such as recreationists and other parts of the general public, will, in a biocentric context, be much more pronounced. Finally, nature, or certain species of it, will be truly recognised as having their own legitimate pattern of 'appropriation' requirements regard the forest.
In the context of justice judgements important 'actors' who have, further, to be differentiated from 'other interest groups' in general are the government and other administrative groups that exert power in the allocation of cost-benefit balances in which forests as resources are involved. A thorough analysis of attitudinal options for forest owners and public groups which is in itself not possible in the context of this text, will need a special focus on policy groups, their views on basic cultural attitudes, and the instruments they use to influence the physical, social, and cultural management of the forest.

3. Some data on justice and appropriation of the other interest group

According to Staub (1978), an important psycho-dynamic concept in the justice assessment by human subjects is the concept of 'reciprocity' in the context of establishing 'equity' in a 'just world'. Reciprocity means keeping your own contribution to the cost-benefit balance of another person in balance with his/her contribution to your own cost-benefit balance. Costs and benefits are here meant in a psychological sense. This may, and will of course in the case of a forest owner, include economic benefits. According to Staub several types of assessment may influence the balance outcome. One assessment may be whether one is personally in some sort of debt towards the other person. If a recreationist in one's forest happens to be a neighbour who at times affords neighbourly services when needed, a forest owner will be more prepared to allow more recreational access for that visitor than for other more distant ones. Staub stresses as a special type of equity mechanism what he calls the 'hedonic balance hypothesis'. People evaluate the extent to which they are personally in a better or worse state of mood than another person who is applying for help. When the outcome of this assessment is a personally worse state the motivation to help will be lower than in the reverse case. If, for example, one meets as a forest owner a recreationist who is apparently in a good mood, and only focused on preserving his personal well-being and perhaps nature also, and does not show any sympathetic understanding for the survival hazards of the 'species' forest owner, which give them a bad mood, this will likely be met by less co-operation for giving access to the forest owner's.

In the reciprocity definition above, the importance of actions of one actor towards the other appear to be essential criteria for the management of reciprocity. In the following example of a study on conflicts between anglers and surfers (De Milliano and Van Sambeek 1986; Boerwinkel 1996) the fine attuning of reciprocity to perceived actions is rather well demonstrated. In this study the appropriation of other user groups and some of their specific actions was assessed with a special scale, the Subjective Motor Appropriation Scale (SUMAS). Elsewhere (Boerwinkel 1996) data are given on theoretical background, validity, and fields in which this scale has been applied. As this scale measures the (emotional) appropriation (acceptance and rejection) of persons and their actions, environments, objects, ideas, etceteras, in general, it can, in agreement with the above stated relationship between appropriation, perception and attitude, as much be considered as a combined perception and attitude assessment in the context of an appropriation assessment.

As is apparent in figures 2 and 3 both groups, anglers and surfers, appropriated the other group rather in the misappropriation or rejection zone. The difference between the average score for anglers towards surfers in figure 2 and the reverse in figure 3 is only significant if it is controlled for age (Boerwinkel 1986b). Apparently the higher average age of the anglers moderated their reactance (emotional distancing; Brehm 1972) towards surfers. When specific actions of the other group

are evaluated, however, the appropriation pattern within each singular group turns out to be rather differentiated. The psychological basis of this differentiation is particularly highlighted when the whole set of SUMAS appropriations is analysed with principal component analysis. The best appropriated actions of surfers by anglers (figure 2, component 1), appear to be actions that are either not annoying at all, or unintendedly so, while caused by inexperience of the other party. The worst appropriated actions (figure 2, component 5) are the intendedly offensive ones, or demonstrations of unconcern for another person's need for recreational space. Surfers on their side appear to react in a similar way, (figure 3, component 1 and 3 respectively; the lower number of components this group showed regarding other user groups and actions of them are due to a smaller number of items that were put into the questionnaire by the researcher).

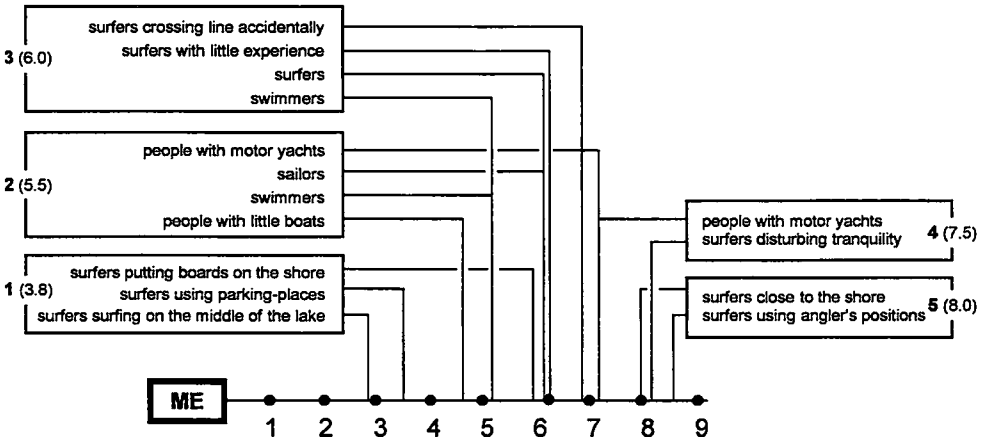

Figure 2: Appropriation patterns in SUMAS mean scores for surfers, their actions, and other elements of the recreational experience, as judged by anglers. Enclosures mark principal components, numbered in order of average SUMAS score (1 = strongest/positive appr.; 9 = weakest/negative appr.) for the dimension (between parenthesis). Adapted from De Milliano and Van Sambeek (1986).

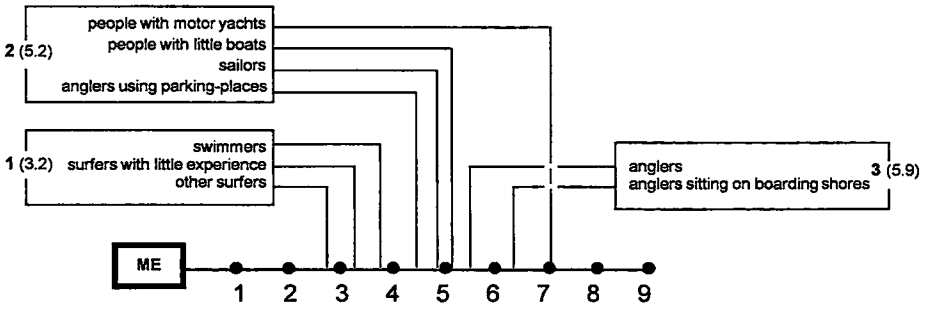

Figure 3: Appropriation patterns in SUMAS mean scores for anglers, their actions, and other elements of the recreational experience, as judged by surfers. Enclosures mark principal components, numbered in order of average SUMAS score (1 = strongest/positive appr.; 9 = weakest/negative appr.) for the dimension (between parenthesis). Adapted from De Milliano and Van Sambeek (1986).

On the basis of undifferentiated reciprocity mechanism one would expect the anglers, who felt more hindered by surfers (71%) than the other way round (39%), to be rather willing to put surfers on their place when management measures are considered. In a small sample of only anglers, who were not established to be representative of the larger sample of figure 2, this unqualified retaliative form of reciprocity did not turn out to be the dominant reaction pattern. When potential measures for relieving the pressure of other user groups of recreation waters on anglers were presented to the anglers, the harsh measures, such as using wire, were on the average rejected while inconspicuous measures, such as creating a secluded inlet, were well accepted (Table 1).

Management solutions on sketch	No. in question	SUMAS mean [1.]	Dim. I excl.	Dim. II priv.	Dim. III aggress.
inlet	5	2.2	-.64	.43	
barren platform	2	7.1	.49		
trees	8	3.0	.45	.44	.49
bushes	10	2.6	.67		.49
floating line	6	3.9	.71		
bench	9	5.5	.78		
platform and reed	1	4.9		.90	
reed hedge	7	4.6		.88	
platform and sign	4	4.3			-.70
platform and wire	3	5.2			.74

1. (1 = strongest/positive appropriation; 9 = weakest/negative appropriation)

Table 1: SUMAS mean scores and principal component loading on three dimensions in the same SUMAS scores regarding 10 sketched solutions, in black-and-white line drawings, for annoyance created by surfers and other user groups on behalf of 25 anglers. Secondary analysis by the present author of data from De Milliano and Van Sambeek (1986).

Again, by using principal component analysis, the underlying psychological dimensions revealed this notion of harshness versus leniency of actions against the other party. These three principal components can thus be considered as 'equity' mirrors of the components of perceived actions of the other group towards oneself as angler (figure 2).

Turning again to the situation of forest owners and other interest groups, such as recreationists and the general public at large, a similar appropriation of, or attitude toward, the other group can be assessed likewise by focusing on actions. Further, a similar outcome may be expected as to the positive appropriation by forest owners of unintendedly annoying actions by other parties, such as recreationists, and more negative appropriations of intendedly annoying actions by those other parties.

As far as the relationship between perception and attitude is concerned it is clear that in the SUMAS appropriation assessment the perception of the actions of the other group, the attitude towards it, and the appropriation of measures against the other group, are as a whole very much intertwined. The focus on differentiated

actions, instead of merely on the group in general, is in accordance with the particular focus on the actions towards an attitude object rather than on the object in general, such as has been promoted by Ajzen and Fishbein (1980). The focus on specific measures, such as are mentioned in Table 1 is also quite in agreement with this line of action centeredness in attitude research.

Conclusion

The use of the concepts 'perception' and 'attitude' appears to be justified as far as the main focus of research is directed on different sides of the relationship between a person and an environment, such as a forest. If the focus is on the sensory side and also particularly concerned with visitors of environments, such as forests, a focus on perception is adequate. If the concern is for forest owners and managers, on the other hand, connected with behavioral aims towards the relational object, a focus on attitude is equally understandable. It should, however, be kept in mind that perception and attitude represent different emphases on the same process of the cognitive, emotional and motivational relating of a person with an object. This psycho-structural kinship of the two concepts is particularly recognised in the conception of the relationship between a person and an environmental object in terms of appropriation. This can be demonstrated with studies in which perceptual and attitudinal objects are assessed with an appropriation scale, such as SUMAS. The perceptual components with regard landscape images that represent different measures to be taken by managers to relieve pressure from another user group of recreation waters on anglers, turn out to be modelled on the same basis on which attitude components towards different actions by the other groups are modelled.

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Public opinion of the protection and economic utilization of forests in Finland

Opinion publique sur la protection et l'exploitation économique des forêts en Finlande

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Abstract: *The study investigates the attitudes of the Finnish public towards economic utilization of forests and forest protection using interview data collected in 1994. One third of the Finns supported increased forest utilization and one fourth increased forest protection. Forty percent of the Finnish public either simultaneously supported increased protection and economic utilization of forests or opposed both of them. Supporters of forest utilization and protection could not be satisfactorily identified by background characteristics. Supporters of forest utilization were better acquainted with forestry than those of forest protection. Forest owners were as often supporters of forest protection as non-owners but clearly more often supporters of economic utilization of forests.*

Keywords: *Attitudes towards forestry, knowledge of forestry, forest protection, public opinion.*

Résumé : L'étude examine les attitudes des Finlandais à l'égard de l'utilisation économique des forêts et de leur protection, selon les données d'une enquête rassemblées en 1994. Un tiers des Finlandais sont favorables à l'augmentation de l'exploitation forestière, et un quart à l'augmentation de la protection forestière. 40 % des Finlandais ont, soit soutenu simultanément la protection forestière croissante et son exploitation économique, soit se sont opposés aux deux. Les partisans de l'exploitation et de la protection de la forêt n'ont pas de caractéristiques générales qui permettent de les identifier socialement de manière satisfaisante. Les partisans de l'exploitation de la forêt connaissent mieux la gestion forestière que les partisans de la protection. Les propriétaires forestiers sont autant des partisans de la protection des forêts que les non-propriétaires, mais ils sont clairement plus souvent pour l'exploitation économique des forêts.

Mots-clés : *Attitudes par rapport à la forêt, Connaissance forestière, Protection de la forêt, Opinions publiques.*

Introduction

In most western countries, forestry has been subject to public criticism during recent decades.

Several hypotheses has been presented to explain the arousal of forestry conflicts. Kennedy (1985), for instance, claims that three factors are in common in most national conflicts: i) an urban society which stresses romantic, non-utilitarian forest or wildlife values, ii) the prominent, sentimental and nostalgic role of forests and wildlife in a nation's heritage, and iii) the reluctance of forestry professional groups and organizations to trade-offs of wood production for other forest uses. Hellström (1995) suggests that forestry conflicts intensify along with the rapid intensification of forestry by an isolated forestry profession *simultaneously with* rapid social change, *or* low importance of forestry in the national economy, *or* little common interest between forestry, recreation and environmental protection.

Both hypotheses seem to be relevant in Finland. The Finnish economy is, however, exceptionally dependent on forests and forest industries which is contradictory to one of the optional prerequisites of forestry conflicts. Two thirds (66 %) of the total land area is covered by forests, the majority of which (62 %) is owned by nonindustrial private forest owners, most often families. The forest industries have during this decade comprised as much as 30-40 % of the value of export (Sevola, 1996).

The public criticism of forestry has been severe and perhaps more persistent in Finland than in other western countries with large forest industries (Hellström and Reunala, 1995). Until the late 1980's, the Finnish criticism mainly focused on forest management practices such as clearcuts, drainage of peatlands, use of chemical herbicides, fertilization, ploughing, construction of logging roads and mechanization of harvesting. Since then the main theme in the debate has been the question of biodiversity, specifically addressing the protection of old-growth forests and endangered biotopes. An increased ecological consideration in forest management has also been demanded (Hellström, 1994; Hellström and Reunala, 1995).
The established groups in forestry conflicts, as in any conflicts, express their views loud enough to be quoted in mass media. Their opinions are well-known. The established groups generally include the forest industries, environmental groups and landowners. The public has no role in the debate. Opinion polls are therefore needed to provide the decision-makers with the knowledge of the opinions and attitudes of the citizens.
The public's attitudes and opinions concerning forestry have been studied extensively (e.g. Hoen and Winther, 1993; Shindler et al., 1993; Bliss et al., 1994; Bourke and Luloff, 1994; Public ... , 1995; Kangas and Niemeläinen, 1996; Zimmermann, 1996). However, there is a danger of misinterpretation when conclusions are drawn based on separate analyses of single statements.

For instance, according to a Finnish study by Hänninen (1994), using the same data as in this study, more than half of the Finns (55 %) agreed with the statement "Cuttings and forest management should be reduced to maintain virgin nature". On the other hand, the great majority (84 %) considered that "Our forests have roundwood in abundance as a raw material for industry". These one-item scales are not proportioned to each other, which may result in an exaggerated impression of inconsistency in the attitudes of the public. Public attitudes concerning abstract environmental issues are naturally always inconsistent to some extent (Uusitalo, 1990).

The construction of summated and cumulative scales of attitudes (Tull and Albaum, 1973; deVaus, 1996) will probably yield more reliable and more consistent results. On the other hand, multivariate methods enable simultaneous analysis of several statements, making it possible to discern between persons with consistent and inconsistent attitudes. In this study principal component analysis was used to condense several statements into few interpretable attitude dimensions, which were used in clustering the citizens into various attitude groups.

Opinion polls have often revealed that the public's knowledge of forestry is poor. Forestry professionals have often pointed out that negative attitudes towards forestry are due to lack of relevant information (Hellström and Reunala, 1995). Another controversial issue worth studying are the possible attitudinal differences between private forest owners and non-owners. The American studies suggest that such differences cannot be detected (Bliss et al., 1994; Bourke and Luloff, 1994).
Consequently, attitudes of the Finnish public towards forestry are analyzed in this study, taking into account inconsistency of the responses. More specifically, the study aims at finding out, how large a proportion of the Finnish population is in favor of increasing forest protection and at the same time opposes the increase in economic utilization of forests, and vice versa. The supporters of forest protection and those of economic utilization are described by easily observable background characteristics. The role of their knowledge of forestry in the formation of their attitudes is also considered. Finally, forest owners and non-owners are compared with respect to their attitudes and knowledge of forestry.

1. Data and methods

The survey data covering the whole country were collected by personal interviews in 1994 by a commercial enterprise (Taloustutkimus Inc.) specialized in opinion polls. The population consisted of all Finnish citizens between 15 and 74 years old. The sample size was 982, but the number used in the analysis was 970 due to non-response of the question on forest ownership. The sample was statistically representative of the Finnish population.
The sampling procedure was stratified sampling, which was based on the provincial proportions of the age, sex and place of residence (urban/rural) of the population. Case weights were therefore applied in the analysis. The non-response could not be investigated in this study. The rate of non-response has usually been rather

small (5-8 %) in opinion polls executed by Taloustutkimus (personal communication, Hannu Ilkas). Major differences were not detected in the comparison of the sample demographics and population census statistics.
The data were originally collected for another purpose, and the objectives of the primary study determined the contents of the questions. This may cause validity problems particularly in attitude measurement. The data were, however, considered to be reasonably suitable for meeting the objectives of this study. The questionnaire included 15 statements concerning attitudes towards forestry measured by a five-point Likert scale (Strongly agree, Agree, Cannot tell, Disagree, Strongly disagree). Questions dealing with knowledge of forestry, as well as background characteristics of the respondents, were also included.
In order to discern between persons with consistent and inconsistent attitudes towards forest protection and economic utilization of forests, the original variables were first condensed by means of principal component analysis into a few interpretable combined variables (e.g. Harman, 1970; Lewis-Beck, 1994). The principal component scores describing support for the forest protection and economic utilization of forests, were then used as grouping variables in cluster analysis. Grouping of owners allowed different combinations of the two dimensions of attitudes. Orthogonal in construction, principal component scores provided a convenient way to avoid the problem of multicollinearity which could distort clustering (Engelman, 1980). The clustering method, K-means clustering, is based on the calculation of Euclidean distances. It is a combination of a hierarchical stem-to-leaf algorithm and iterative partitioning (Anderberg, 1973; Hartigan, 1975).
The groups based on attitudes were identified by background characteristics using logit models (Maddala, 1984; Hosmer and Lemeshow, 1989). The dependent variable in the models was dichotomous: "membership choice" of the specific group versus other citizens. Multinomial models were also technically possible, but binary models were preferred because they identify the specific group of citizens from other citizens instead of comparing all groups with each other simultaneously. The attitude groups were further used in the analysis of knowledge of forestry and in the comparisons between forest owners and non-owners.

2. Results

2.1 Attitude groups

Fifteen separate statements describing the attitudes of the public concerning forests were condensed into four attitude dimensions using principal component analysis (Table 1). The reliability of the solution was satisfactory (Carmines' theta = 0.69).[1] The first dimension was interpreted to describe *support for protection of forests* according to the highest loadings on the principal component. It represents support for the statements "Cuttings and forest management should be reduced to maintain virgin nature", "The majority of forests should be maintained as untouched virgin nature", "Forest management and cuttings in our forests form a menace to the profusion of flora and animal species", and "More tax funds should be used for the protection of old-growth forests".

	I	II	III	IV
Cuttings and forest management should be reduced to maintain virgin nature.	0.758	*	*	*
The majority of forests should be maintained as untouched virgin nature.	0.711	*	*	*
Forest management and cuttings in our forests form a menace to the profusion of flora and animal species.	0.680	*	*	*
More tax funds should be used for the protection of old-growth forests.	0.597	*	*	*
Timber cuttings are necessary for the health of forests.	*	0.642	*	*
The welfare of our country will be based on forests also in the future.	*	0.638	0.333	*
The utilization of forests should be intensified to improve our standard of living.	*	0.614	*	0.274
A well-managed forest is suitable for berry and mushroom picking as well as for hiking	*	0.583	*	*
Our forests have roundwood in abundance as a raw material for industry.	-0.267	0.524	*	*
The forest industries cope well with the requirements of international competition.	*	*	0.800	*
The forest industries are the most important foundation and maintainer of welfare in our country.	*	*	0.747	*
The forest industries are an old-fashioned and stagnant branch of industry.	*	*	-0.582	*
Site preparation by machine to ensure the development of plants is acceptable in principle.	*	*	*	0.785
Clear-cutting and planting or sowing seeds is acceptable in principle.	*	*	*	0.763
Modern methods enable roundwood harvesting from the forest without damaging nature.	-0.250	*	*	0.505
Eigen value	2.117	1.923	1.689	1.656
Proportion explained	14 %	13 %	11 %	11 %
n	970			

Table 1: Public's attitudes towards forestry. Principal component analysis. Varimax rotation. (Loadings below 0.250 denoted by asterisk).

Interpretation of the principal components:

I "Support for protection of forests"

II "Support for economic utilization of forests"

III "Positive company image of the forest industries"

IV "Acceptance of present forest management methods"

Support for the following statements was condensed into the second attitude dimension: "Timber cuttings are necessary for the health of forests", "The welfare of our country will be based on forests also in the future", "The utilization of forests should be intensified to improve our standard of living", "A well-managed forest is suitable for berry and mushroom picking as well as for hiking", and "Our forests have roundwood in abundance as a raw material for industry". The dimension was considered to describe support for economic utilization of forests.

The third attitude dimension could be interpreted to represent positive company image of the forest industries as a competitive, modern branch of industry that forms a foundation of economic well-being. Finally, the fourth dimension was considered to describe acceptance of present forest management methods (e.g., clear-cuttings, site preparation by machine).

Two of these attitude dimensions, support for forest protection and economic utilization of forests describe attitudes distinctively contrary to each other. They were therefore chosen for further analysis. Moreover, the differences between the attitudes of the forest owners and other citizens were manifested only with respect to these two dimensions.

The objective of the cluster analysis was to discern between persons with consistent and inconsistent attitudes towards forest protection and economic utilization of forests.

A four-group solution proved to be straightforward to interpret and satisfactory as to the group size (Table 2).

Attitude group	n	Mean of principal component score (standard deviation)	
		I Support for protection of forests	II Support for economic utilization of forests
I Supporters of forest protection	233	0.893	-0.393
		(0.581)	(0.481)
II Positively inconsistent	229	0.708	0.942
		(0.606)	(0.398)
III Negatively inconsistent	174	-0.334	-1.508
		(0.748)	(0.755)
IV Supporters of forest utilization	334	-0.934	0.414
		(0.546)	(0.516)
	Σ 970		
F-ratio		549.889	804.646
P-value <		0.000	0.000

Table 2: Grouping of the public by their attitudes towards forestry. K-means cluteing

In the first group, the mean of the principal component score describing attitudes towards forest protection was positive and that of attitudes towards utilization negative. In other words, the interviewees belonging to this group emphasized protection of forests and did not support economic utilization. Consequently, such persons can be characterized as supporters of forest protection. In the fourth group, the signs of the means of the principal component scores were the opposite: economic utilization of forests was emphasized at the expense of nature conservation. Thus the group can be labeled supporters of forest utilization. In both groups, the coefficient of variation of the principal component score representing support for protection of forests was distinctively smaller than that of attitudes towards utilization. This indicates that attitudes concerning protection of forests were more consistent than attitudes towards economic utilization.

The two other attitude groups were more difficult to interpret. In the second group, the means of both the support for forest protection and economic utilization of forests were high and positive. The persons belonging to the group obviously supported the increased forest protection and increased economic utilization at the same time. Subsequently, the group was labeled *positively inconsistent.* In the third group, the interviewees took a negative attitude both towards forest protection and economic utilization, and were labeled *negatively inconsistent* accordingly. The analysis of the coefficients of variation in these two groups suggested that the attitudes related to the economic utilization of forests were clearly more consistent than the attitudes towards protection.

Figure 1 shows the proportions of the Finns belonging to the attitude groups. More than one third of the Finns belonged to the supporters of economic utilization of forests and close to one fourth to the supporters of forest protection. This means that fifty-nine percent of the population had a distinct (either-or) attitude towards the increased protection or utilization of forests. One fourth of the Finns were positively inconsistent and one sixth negatively inconsistent. In total, forty-one percent of the citizens had no clear attitude to the issue.

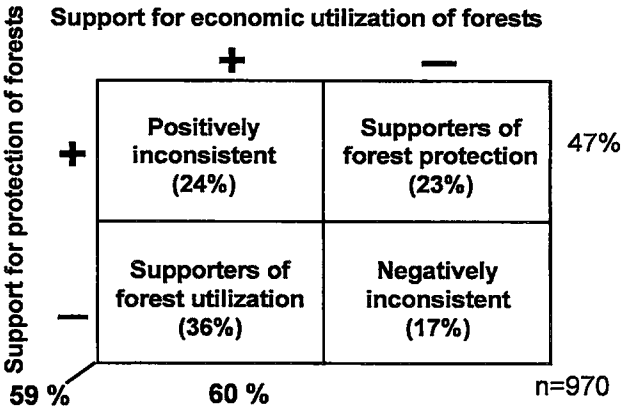

Figure 1: Grouping of the public by their attitudes towards forestry
(+ positive attitude,- *negative attitude)*

The results also reveal that forty-seven percent of the Finns supported the increased protection of forests and sixty percent the increased economic utilization of forests, when positively inconsistent persons were included.

2.2 Supporters of forest utilization and forest protection

Background characteristics of the supporters of forest utilization and protection were identified using separate logit models for each group. The objective was to identify the persons belonging to the specific group from other people.[2]

According to the results, a person belonged to the *supporters of forest utilization* most probably if he was male, and more than 30 years old, had a college or academic degree, lived in the southern part of the country[3], and was a forest owner (Table 3). In this case the probability of belonging to the group was 68 % (Appendix 1).

Sex Male=1	Age More than 30 years=1	Location of permanent residence Southern Finland=1	Forest owner Yes=1	Education College or academic=1	Probability of assignment to the group (π) %
Supporters of forest utilization:					
1	1	1	1	1	68
0	0	0	0	0	9
Supporters of forest protection:					
0	0	0			53
1	1	1			13

Instead of calculating the odds ratios or marginal effects (Demaris, 1992; Hosmer and Lemeshow, 1989), the direct probabilities of the group assignment were calculated. This was carried out by using different value combinations of the background variables, as suggested by Roncek (1991). The table indicates that the probability of a respondent of belonging to supporters of forest utilization was 68 % in the most "favorable" case, i.e. the value combination with the highest probability, and 53 % considering supporters of forest protection, respectively.

Appendix 1: Probability of assignment (π) to the supporters of forest utilization and forest protection by background characteristics. The most "favorable" and "unfavorable" combinations of the variables.

Characteristic	I	II
	Coefficient (Wald statistics)	
Constant	-2.342	0.105
	(8.57)	(0.443)
Sex	0.775	-0.722
Male=1	(5.43)	(4.50)
Age	0.629	-0.905
More than 30 years=1	(3.82)	(5.65)
Forest owner	0.491	-
Yes=1	(3.01)	
Education	0.521	-
College or academic=1	(3.30)	
Location of permanent residence	0.674	-0.422
Southern Finland=1	(2.91)	(1.94)
Log-likelihood	-583.868	-503.464
R_L^2 (likelihood ratio index)	0.06	0.05
n	967	967

Table 3: Identification of the supporters of forest utilization (I) and forest protection (II) by background characteristics. Logit analysis. Maximum likelihood estimates.[1]

The supporters of forest protection were not clearly distinguished from other citizens by the conventional background features. However, the probability of belonging to the supporters of protection increased to a certain extent if the person was less than 30 years old, female, and lived in Northern Finland (Table 3). In this case the probability of belonging to the group was 53 %. It is obvious that the model identifying the supporters of protection does not give a distinct picture of what kinds of Finns are so much in favor of forest protection that they are willing to compromise on the economic utilization of forests. Contrary to expectations, rural and urban residents seemed not to differ from each other as regards to their attitudes towards forestry.

[1] Initial models were estimated by stepwise procedure. Final models presented in the table contain only statistically significant variables. Other variables included in the analysis were residence in urban/rural center, occupational status (e.g., farmer, worker, clerk, private entrepreneur, manager, housewife, student, retired), and family income.

2.3 Attitudes and knowledge of forestry

The supporters of forest utilization were better acquainted with forestry than the supporters of forest protection (Table 4). They knew more often than the supporters of protection that "Our forests produce more wood than is being cut from them", "The wood reserve of our forests has increased during this century", and "The measures for environmental protection of forest industries have resulted in improved condition of the water systems in our country".

	%		
	of supporters of forest utilization	of supporters of forest protection	of all citizens
1 Our forests produce more wood than is being cut from them.	77(3) *[1]	46(9)	62(7)
2 The wood reserve of our forests has increased during this century.	64(12) *	38(11)	50(12)
3 The measures for environmental protection of forest industries have resulted in improved condition of the water systems in our country.	70(6) *	54(7)	61(6)
4 Which of the forest owner groups below owns most forests in Finland ?			
- private families	36 *	15	25
- the state	44	52	49
- the forest industries	14	16	15
- others[2]	4 *	13	9
- no opinion	2	4	2
n	334	233	970

Table 4: Knowledge of forestry among supporters of forest utilization and forest protection. The proportion of interviewees who agreed or strongly agreed is given under the questions 1 to 3 (the proportion of answers no opinion in brackets).

[1] difference significant at the 5 percent level (2-way test)
[2] communes, congregations, and banks

One half of the Finns believed that the state owns the majority of the forests and only one fourth knew that private forest owners are the largest owner group in terms of forest area. One third of the supporters of forest utilization knew that private families were the major owner group. Similarly almost half thought the state owns the majority of the forests. Only fifteen percent of the supporters of forest protection knew that private families were the largest owner group.

2.4 Forest owners and other citizens

There are about 440 000 nonindustrial private forest holdings in Finland (Sevola, 1996). However, there are considerably more persons who own forest.[4] The data of this study indicated that about 850 000 persons own forest which is close to the estimate given by Ripatti (1994). Every sixth Finn seems to be a forest owner. Forest owners' attitudes towards forestry differed from those of other Finns. About half of the forest owners belonged to the supporters of economic utilization of forests while only every third of the non-owners shared this attitude (Fig. 2). One fifth of the forest owners supported protection whereas protection supporters amounted to one fourth among non-owners. Forest owners supported protection almost as often as other citizens.

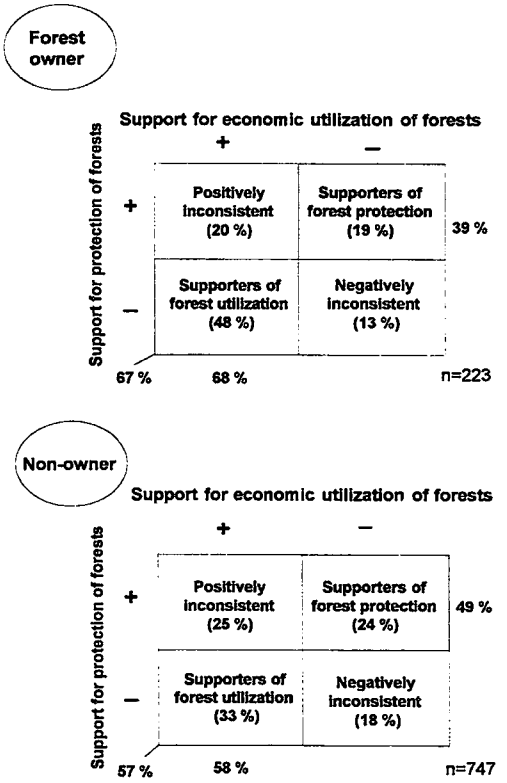

Figure 2: Grouping of forest owners and other citizens by their attitudes towards forestry (+ positive attitude, - negative attitude).

Differences were also detected in the knowledge of forestry between the forest owners and other citizens. Forest owners were generally better acquainted with forestry than non-owners (Table 5). The differences were, nevertheless, not as clear as those between the supporters of forest utilization and forest protection.

	%		
	of forest owners	of non- owners	of all citizens
1 Our forests produce more wood than is being cut from them.	72(4) *[1]	58(7)	62(7)
2 The wood reserve of our forests has increased during this century.	63(10) *	47(13)	50(12)
The measures for environmental protection of forest industries have resulted in improved condition of the water systems in our country.	64(7)	61(5)	61(6)
4 Which of the forest owner groups below owns most forests in Finland ?			
- private families	39 *	20	25
- the state	38 *	53	49
- the forest industries	12	16	15
- others[2]	4 *	13	9
- no opinion	3	2	2
n	223	747	970

Table 5: Knowledge of forestry among forest owners and non-owners. The proportion of intrviewees who agreed or strongly agreed is given under the questions 1 to 3 (the proportion of answers no opinion in brackets).

[1] *difference significant at the 5 percent level (2-way test)*
[2] *communes, congregations, and banks*

3. Summary and discussion

Attitudes and opinions of the public are usually studied by statements given in questionnaires.

Opinion polls have, nevertheless, often been criticized (e.g., Bourdieu, 1979) and the relevance of knowledge concerning specific environmental attitudes has been questioned. For instance, Ungar (1994) claims that the environment is a poor domain for linking individual attitudes and behavior.

According to her view, a macro approach which addresses revealed preferences in a social context would be more promising if difficult to adopt in practice. Moreover, Uusitalo (1990) regards attitude-behavior inconsistency and free-rider behavior as the major problems in studying environmental attitudes. Opinion polls are, however, a channel through which the knowledge of the opinions and attitudes of the citizens can be provided to the decision-makers at a relatively low cost. Properly interpreted by the decision-makers, poll results can give insight on what citizens consider to be important.

In this study, an attempt is made to overcome one potential source of misinterpretation of opinion polls. The conclusions based on single attitude statements could result in an exaggerated impression of inconsistency in the attitudes of the public. Multivariate methods were therefore used to discern between persons with consistent and inconsistent attitudes towards forest protection and economic utilization of forests. Principal component and cluster analyses were applied to group citizens.

According to the study, about sixty percent of the Finns had a distinct attitude towards increased protection or economic utilization of forests. One in four citizens would be ready to increase forest protection at the expense of wood-production. On the other hand, an increase in the economic utilization of forests at the expense of protection was supported by one third of the Finns.

Almost half of the citizens (40 %) had to some extent inconsistent attitudes to the use of forests. They simultaneously supported the increased protection and economic utilization of forests or opposed both of them. On the other hand, an increase in the protection and economic utilization of forests at the same time is not necessarily contradictory. The present abundant forest resources enable a simultaneous increase in the forest protection and utilization of forests to meet the roundwood demand of the Finnish forest industries. The questions concerning knowledge of forestry indicated, however, that the general public was not familiar with the abundance of wood resources (or do not trust this information). The citizens taking a negative attitude towards both the increased protection and economic utilization of forests (negatively inconsistent) obviously accept the present situation or are indifferent to the issue.

The background characteristics of the population only partly explained the attitudes to the use of forests. Persons supporting the increased economic utilization of forests were most probably more than 30 years old, and male, had at least a college degree, lived in Southern Finland, and were forest owners. The supporters of protection were not as clearly distinguished from other Finns. The probability of belonging to the supporters of forest protection increased somewhat if the person was less than 30 years old, female, and lived in Northern Finland.

Women are often considered to be more concerned about the condition of the environment than men.

The gender difference was also detected in this study. The assumption on differences between sexes is based on at least two different arguments, both lacking strong empirical support. According to the first one, women are socialized from childhood to raise and care for their families, and men are socialized to be family breadwinners and economic providers. The nurturing attitudes have been translated into environmental domain. The other line of reasoning is based on gender differences in the family and workplace roles during adulthood (Mohai, 1992; Steel et al., 1994).

The fact that the support for protection is linked with youth is expected (Kangas and Niemeläinen, 1996). The result is also in accordance with the well-known materialism/ postmaterialism hypothesis by Inglehart (1977). It is, however, surprising that the protection of forests was more strongly supported in Northern Finland than in southern part of the country (c.f. Kangas and Niemeläinen, 1996), because the majority of the protected forests are already located in Northern Finland. On the other hand, it is possible that northern inhabitants consider the restrictions of timber cuttings to maintain or even improve the preconditions for tourism.

The level of formal education is often associated with environmental concerns. Persons with higher levels of education are more likely to show concern for environmental problems than those with lower levels of education. Education seems to make it easier to understand complex environmental issues (Steel et al., 1990; 1994). The results obtained in this study suggest the opposite: higher education tends to increase the support for economic utilization of forests. It is possible that education deepens the insight of the economic importance of forests in Finland, or leads to a more favorable attitude towards dominant economic thinking in general.

Another result contrary to expectations was associated with the place of residence of the respondents. No difference was detected between rural and urban residents concerning their attitudes. The literature suggests that urban residents are more likely to support proenvironmental attitudes: the original idea of forest protection is a product of urban culture (Steel et al., 1994).

Differences in knowledge of forestry were detected between the supporters of forest utilization and protection. The supporters of utilization were better acquainted with forestry issues than those of protection. Knowledge concerning forestry seems to pre-determine favorable attitudes towards economic utilization of forests. On the other hand, favorable attitudes may encourage people to look for more information on forestry.

The Finnish forest owners supported utilization of forests clearly more often than other Finns but they also considered forest protection important. There were approximately as many supporters of protection among forest owners as among other citizens. The result disagrees with a Finnish study by Kangas and Niemeläinen (1996). Forest owners also had better knowledge concerning forestry issues than non-owners.

On the other hand, American studies have not found significant differences between the attitudes of forest owners and other citizens (Bliss et al., 1994; Bourke and Luloff, 1994). The difference between the results for Finland and the USA could probably be explained by the greater dominance of small forest holdings in the USA. About seventy percent of the American forest owners own less than 4 hectares of forest land (Haynes, 1990). Timber production and income from roundwood sales are not often the primary reasons of owing forest land (e.g., Young et al., 1985; Brooks and Birch, 1986).

The forest extension organizations have traditionally concentrated on distributing information to forest owners. It is obvious that more information on forestry issues should be distributed to the general public. Instead of one-sided flow of information, interaction between professionals and the public should be underlined. Participatory forest planning in state forests is a good example of this approach. If forestry professionals and the public have permanently different images on good and sustainable forest management, the disputes over management methods and forest protection will continue in the future.

Notes

1. Carmines' theta is computed for the unrotated solution as follows: $\Theta = \frac{N}{N-1}(1-\frac{1}{\lambda_1})$, where N is the number of items in the total principal component analysis and λ_1 is the largest (the first) eigenvalue. Theta can be regarded as a maximized Cronbach's alfa coefficient (BMDP..., 1992; Carmines and Zeller, 1979).

2. Similar models were estimated for both positively and negatively inconsistent citizens. The probability of belonging to the positively inconsistent group increased if the person was female, and more than 30 years old, did not have college or academic degree, and lived in urban or rural center. On the other hand, the assignment to the negatively inconsistent group was more probable if the person was less than 30 years old, was a manager/private entrepreneur, and did not own forest.

3. To the south of Oulu province.

4. Forest can be owned either alone, together with the spouse and/or children, or as a member of heirs or family concern.

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Measuring forest preferences of the population a danish approach

La mesure des préférences de la population concernant la forêt ; une approche danoise

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Abstract: *This paper is based on the report entitled "Forest recreation in Danmark" by Koch and Jensen (1988). The authors discuss the concept and the interest of preference measurements. They give an overview of measuring methods with their advantages and disadvantages. The main question is to find a balance between the requirements on measurement validity and representativity. The second part of the paper describes how the preference surveys developed at the Danish Forest and Landscape Research Institute are implemented. Two national interview based surveys, which embraced 3 087 persons, have been performed in 1977-78.*

The first surveys uses the "Experimental Method" based on a postal questionnaires. Respondents assess 52 black and white photographs considered in pairs, and 100 verbal stimuli.

The second survey uses the "Standard Assesment Method" which is an improvement proposed by Koch of the "Scenic Beauty Estimation Method". 216 persons have been shown 80 colour slides photographed at different seasons. Processing and analysis of data, sources of errors and main outcomes are discussed.

Résumé : Cet article s'appuie sur le rapport "La fréquentation des forêts au Danemark" rédigé par Koch et Jensen (1988). Les auteurs discutent le concept et l'intérêt des études de préférence. Ils donnent une revue des méthodes de mesure, ainsi que leurs avantages et inconvénients. La principale question est de trouver un équilibre entre les exigences en terme de validité et représentativité. La seconde partie de l'article décrit les enquêtes de préférences réalisées à l'Institut Danois de Recherche sur la Forêt et le Paysage. Deux enquêtes nationales ont été réalisées en 1977-78 auprès de 3087 personnes. La première enquête utilise la "Méthode expérimentale" basée sur un questionnaire diffusé par voie postale. Les enquêtés évaluent 52 photographies noirs et blancs présentées par paires, et répondent à 100 questions. La seconde enquête utilise la "Méthode d'évaluation standard" qui est une amélioration proposée par Koch de la "Méthode d'estimation de la beauté scénique". 216 personnes ont visionné 80 diapositives couleur photographiées à différentes saisons. Le traitement et l'analyse des données, les sources d'erreur et les principaux résultats sont discutés.

1. Preference measurements in general

This paper is based on the report entitled "FOREST RECREATION IN DENMARK. PART IV: THE PREFERENCES OF THE POPULATION" by *Koch & Jensen* (1988).

1.1 What are preference measurements?

In general, *the purpose of preference measurements is to quantify different people's assessments of different relevant stimuli.*

This type of measurement is used in a number of different disciplines, such as market analysis, company management, psychology, sociology, economy and political science.

In the present case, however, it is a question of *measuring different population segments' assessments of various influences relevant to recreational activities associated with the forest.*

The *influences* considered *relevant* in the context of recreational activities related to the forest can be subdivided into the following main groups:

1. environment-related influences, over which the forest and landscape manager normally has no control (e.g. aircraft noise and climate);

2. management-related influences, such as the selection of tree species, construction of forest roads, installation of benches, etc.;

3. influences related to recreational use, i.e. other general influences of recreational use on the quality perceived by individuals in their recreational activities, since these influences must be assumed to depend on:

– frequency of use (extent of recreational use),
– type of use (recreational activities conducted),
– geographical and temporal distribution of use,
– extent of annoying/harmful behaviour.

As the landscape manager can regulate recreation-related and management-related influences, it is first and foremost considered most relevant to study the effects of these influences on the quality of a visit to the forest.

However, the quality perceived by individuals in their recreational activities does not depend solely on the INFLUENCES to which they are exposed in these activities. The PERCEPTION and ASSESSMENT of these influences is also determined by the context in which they occur (place, time and weather conditions), as well as the expectations and experience of the individual. Apart from this, COINCIDENCES also have considerable effect on perception (was a roe-deer seen or not?) as well as on the assessment (for instance, random changes of mood).

It is possible to characterise some of the measurements made in connection with research on recreational use as follows (cf., e.g. *Koch* 1986):

1. *measurements of use:* measurement of BEHAVIOUR (see, e.g. *Jensen* (1995) for an overview of user surveys in the Nordic countries);

2. *measurements of preferences:* measurement of the ASSESSMENT of INFLUENCES (PREFERENCE SCORE);

3. *measurements of perception:* measurement of the PERCEPTION of INFLUENCES only (for the time being, the concept of "perception" can be used broadly and can also embrace assessment and behaviour (cf., e.g. *Countryside Recreation Research Advisory Group* 1970).

These three forms of measurement concern the *consumption* and *need/demand.* It is also possible to discuss *landscape measurements/landscape analyses.* These should be understood as the *opportunities* offered by the landscape, - traditionally based on experts' perceptions of the significance of different elements in the landscape. For a more detailed introduction to this type of measurement, the reader is referred, for instance, to *Dunn* (1974), *Zube et al.* (1982, "*The expert paradigm"), Stahlschmidt* (1983), *Lucas* (1991), and *Bell* (1993).

The *purpose* of conducting use and preference measurements when mapping the significance of the forest to recreational activities is to make it possible for such measurements to form *part* of the input information, e.g. for:

1. the design of areas and structures,
2. dimensioning of areas and structures?
3. dimensioning of the intensity of administration, management and maintenance,
4. possible zoning of different types of area use, including zoning of various recreational activities,
5. forecasts of use and preferences,
6. economic assessments.

However, before continuing work in this direction, it is first convenient to discuss the question treated in the next section:

1.2 Is there a need for preference measurements?

In the authors' opinion, the following arguments are *in favour* of surveying the desires of the general population and forest visitors, from the standpoint of the form of the forest:

1. society is apparently prepared to pay relatively large amounts in order to satisfy the population's need for outdoor recreational activities (cf., e.g. *The National Forest and Nature Agency* 1995);

2. several surveys have shown that landscape managers' own preferences - or their perception of visitors' preferences - do not always agree with the visitors' true preferences (cf., e.g. *Hendee & Harris* 1970, *Willhite & Sise* 1974, *Hultman* 1981 *and Jensen* 1993). The latter divergence from the standpoint of "the producers'" perception of "the users'" desires is explained as follows by *Hendee & Harris* (1970, p. 762):*"... since a large part of their work results from problem users, it would be strange indeed if their perception of typical users were free of bias.";*

3. the lack of knowledge of the different preferences of forest visitors makes the landscape manager an easy victim of what *Gregory* has called landscape management according to the *"the squeaking wheel principle":* 'The wheel that squeaks the loudest gets the oil'. The dissatisfaction of the more well-formulated interest groups is minimised, which hardly leads to optimisation of the total satisfaction of needs, but rather to the formulation of a mediocre compromise (*Gregory* 1972, p. 405 f).

However, preference measurements only constitute *a part* of the politicians' and administrators' decision information, even in areas where recreational activities are given the highest priority. We must remember that, as far as the preferences of visitors and the population in general are concerned, the following applies:

"These desires may be impossible, selfish and conflicting, based on faulty data, short sighted, and changing or capable of being changed." (*Lucas* 1966, p. 121).
The population's knowledge in general, for instance, of *the dynamics of nature*, would obviously be less than that of the landscape manager. This can result in a desire to avoid the less exciting phases of forest management and the natural cycle of the forest, regardless of the fact that they are necessary in order to attain the desired phases.

In addition, an *undifferentiated* "mean" of the population's desires can only provide an unsatisfactory basis on which to make decisions. If we only attempt to satisfy "the average person" we can only satisfy a few people, whereas a *variegated* range of alternatives, which is in harmony with the surroundings and the *differing* desires of visitors, can satisfy far more people (cf. *Canger & Koch* 1986, p. 25 f). *Shafer*, among others, has considered this more closely in an article with the telling title: *"The Average Camper Who Doesn't Exist"* (1969). Thus, apart from determining their dependency on time and place, it must also be possible to consider preferences in relation to socio-economic data and visiting frequencies, visit duration and activities during visit.

It is therefore our understanding that there is a need for knowledge of how different groups of the population assess different recreational assets, so that the data on which the politicians and administrators base their decisions can be expanded.

1.2.1 Previous surveys

A need for knowledge is not, however, synonymous with a need for new surveys. Are no earlier preference measurements available, the results of which could be used?

At the global level, a great number of surveys have been conducted on the preferences of different population segments for different types of landscape. One of the most comprehensive bibliographies - which is nonetheless rather incomplete - contains 2058 references *(Goodey et al.* 1975). An overview of (some) Scandinavian surveys is given by *Jensen* (1995), *Axelsson-Lindgren* (1995) and *Komulainen* (1995).

Several surveys indicate that there could be more general preferences for different types of landscape, across the boundaries of cultural and social differences (e.g. *Rozsnyay* 1972, *Shafer & Tooby* 1973, *Brush* 1974, *Zube & Mills* 1976, *Buhyoff et al.* 1983 and *Ribe* 1989). However, such general preferences have yet to be completely revealed (cf. *Koch* 1977a).

On the other hand, several surveys have shown that the preferences of visitors can vary considerably, even over short distances, from one cultural area to another and between different segments of the population (e.g. *Shafer* 1969, *Lucas* 1970, *Koch* 1974, *Jaatinen* 1976, *Andersen et al.* 1977, *Zube & Pitt* 1981, *Manning* 1985 and *Koch & Jensen* 1988).

Thus, a knowledge of different population segments' preferences for different types of landscape cannot be based solely on the results of foreign surveys.

1.3 Requirements on method of measurement

The following five requirements can be set on any measurement:

1. representativity;
2. reliability;
3. validity;
4. precision;
5. sensitivity.

The significance of these requirements is discussed in brief below; for a more detailed discussion see, e.g. *Hansen* 1979, *Ray* 1979 and *Rossi et al.* 1983.

1.3.1 Representativity and non-response

The requirement on *representativity* is only relevant when measurements only represent a subset of the totality of which knowledge is desired. However, this is often the case. In any event, it is *only* possible to assess the representativity of measurements objectively, unless the elements measured were selected as a random sample of a well-defined whole/population. It is then possible to calculate statistical error - the *"representation error"* - that results from a failure to measure all elements.

It is often the case that preference measurements are not based on randomly selected samples of a well-defined population. This means that the results can only be said to be representative of the persons who responded. And any generalisation based on such measurements can lead to seriously erroneous conclusions.

A single example: it was ascertained in a Danish survey that there is a relatively large need for camping sites in the State forests; but how much significance should we attach to this result, when we consider that about 65% of the responses were obtained from visitors to a camping exhibition in Copenhagen?

Even if a measurement was originally made from a randomly selected sample of a well-defined population, the representativity of the survey can be destroyed by *non-response,* which can occur, for instance, as a result of a lack of willingness and/or ability to respond. *Non-response* can entail highly significant systematic errors, the direction and magnitude of which can only be estimated.

If *seasonal variations* are to be expected in the variables to be measured, it is also necessary for measurement to be representative of the times about which a statement will be made. For instance, it cannot be presumed acceptable to generalise on the basis of a measurement of preferences for different tree species, e.g. if the measurement was carried out when the beeches were leafing or when there was snow on a coniferous forest. In several cases, it has been possible to ascertain that preferences for different types of forest and landscape depend on the season in which the survey was conducted (cf., e.g. *Koch* 1974, p. 97, *Buhyoff & Wellman* 1979 and *Koch & Jensen* 1988).

While the first requirement on a measurement concerns the *sampling errors* and the *non-response errors,* the other four requirements concern actual *measurement errors.* In this area, as in other areas of the theory of preference measurements, the terminology is rather confusing, which can probably be attributed in part to the interdisciplinary background of preference measurements (cf. *Koch* 1977a, p. 21, *Redder et al.* 1970, p. 159, *Hansen* 1979, p. 50 and *Ray* 1979, p. 4).

1.3.2 Reliability

The requirement on *reliability* should be understood as the requirement that the measuring instrument give the same results in repeated measurements conducted under identical conditions. In other words: the requirement that *random* variations ("noise") do not disturb the measurements (cf., e.g. *Bohrnstedt* 1983).

In connection with preference measurements, random variations in the measurements can be due, for instance, to random mood changes by the respondents or interviewer, or random variations in the physical surroundings in which measurement is conducted.

1.3.3 Validity

The requirement on validity should be understood as the requirement that the measuring instrument be capable of measuring that which is to be quantified. In other words: the requirement that there should be no *systematic* differences between the measurements and the true value of the variable to be quantified (cf., e.g. *Bohrnstedt* 1983).

If a measuring instrument is to possess a certain validity, a necessary condition is that it possess a certain degree of reliability. However, a high degree of reliability is no guarantee of a high degree of validity. For instance, if we measure the diameter of a tree with a pair of calipers calibrated with 11 millimetres/centimetre, repeated

careful measurement will yield the same result. Thus, this measurement has a high degree of reliability, although it lacks validity.

It is also possible to speak of the *internal validity* of a measurement: if what is being measured is due to the stimulus, and to speak of a measurement's *external validity,* i.e. whether or not the conclusions drawn can be transferred with reasonable certainty to the "real world" (cf. also *Hansen* 1979, p. 49 ff.). Thus, a laboratory experiment will normally be characterised by high internal but lower external validity, whereas the opposite will normally be true of a field experiment.

In preference measurements, it is more difficult to determine the validity of the measurement. In the first place, because it is rarely possible to set objective criteria for the validity of a preference measurement. And in the second place, because it is not easy to verify that the measurement satisfies these criteria.

1.3.4 Precision

The requirement on precision should be understood as the requirement that measurements be made according to the most precise *measuring scale* possible.

For instance, when measuring the height of trees, it is possible to measure height in metres (on a *ratio scale*), or simply to rank the trees according to whether they are taller or shorter than others (measure on an *ordinal scale*).

1.3.5 Sensitivity

The final requirement on a measurement - the requirement on *sensitivity* - should be understood as the requirement that measuring instrument's scale be sufficiently finely graded.

For instance, a pair of calipers can be calibrated in centimetres, millimetres or, perhaps, even in 1/10 mm. *Sensitivity* must not however be confused with *precision.* Regardless of how fine the calibration of the calipers, it remains a question of the measurement of length on a *ratio scale.* In a corresponding manner, it is possible to rank people into three social classes, or a 9-point scale could be used, for instance. Although the latter scale is more *sensitive* than the former, it is still a matter of measuring with the *precision* of an ordinal scale in both cases, and so only the operations permitted on ranking data can be applied.

1.3.6 Interaction between different requirements on measurement

A number of relationships exist between the conditions that determine the quality of measurement: between the statistical confidence, reliability, validity, precision and sensitivity.

For instance, we can increase the statistical confidence by increasing the sample size; but on condition that the resources of the survey remain constant, this leaves fewer resources per measurement and, all other things being equal, a greater risk of measuring error. Similarly, it is often possible to increase the reliability and validity of a measurement by increasing the number of questions. However, if the interview becomes too long it can tax the diligence of respondents and, thus, reduce reliability. As a third example, it should be mentioned that attempts to

increase the sensitivity of a measuring instrument by grading the scale more finely can easily lead to reduced reliability (see also Fig. 1).

The relationships between the conditions that determine the quality of measurements depend however on the specific measuring situation. And these relationships are rarely fully clarified in advance. When establishing a new measuring instrument, it is therefore only possible to attempt to achieve a sensible balance between the different requirements that we can set on a measurement.

Moreover, the crucial factor in connection with preference measurements is that, as mentioned above, it is seldom possible to clarify the validity of these measurements in an objective way. However, this should not mean that we stare blindly at *the sampling errors,* which - on condition that the measurements are based on a randomly selected sample of a well-defined population - can be calculated relatively easily. The *measurement errors* can be of considerably greater significance, although their direction and magnitude can normally only be estimated.

1.4 Overview of measuring methods, their advantages and disadvantages

1.4.1 Data-acquisition techniques/paths of cognition

In general, the *data acquisition techniques* that can be used in an attempt to attain new cognition can be subdivided into the following main groups:

1. tabulation of *secondary data* which was originally obtained with some other purpose in mind (utilisation of existing sources);

2. collection of *primary data from respondents,* which can be carried out either by *observing* or *interviewing;*

3. *the experiment,* in which we can differentiate between:

    a. *the controlled experiment,* in which we attempt to exclude all factors other than those which we wish to study. These factors, the independent variables, are thus manipulated to provoke any possible effects;

    b. *the natural experiment,* in which not all background factors are controlled. Observations are based on manipulating a factor and ascertaining any correlation and its ordering in time, since we must demand that cause comes before effect;

4. *simulation,* by which we usually understand the study of mathematical/logical models of the system, instead of the system itself. This concept is sometimes used in a broader sense, which also includes physical manipulation with models - e.g. experimental games.

It should be noted that other designations can be used for these data-acquisition techniques. In addition, the boundaries of the above subdivisions are not fixed.

Such subdivision is, however, appropriate. The experiment - primarily the controlled type in this case - is the most reliable method, in part as input data for making dispositions, and in part in recognition of the desire to demonstrate causal relationships.

It is difficult to apply the *experimental method* to analyses - including preference measurements - in the social sciences. For this reason, it is also not usually possible to attain any actual understanding of *causal* relationships, and so we must be satisfied with an expanded recognition of the problem.

Secondary data and *simulation* are very uncommon methods of attaining new cognition in connection with preference measurements. As far as preference measurements are concerned, the most important path of cognition is the *acquisition of primary data from respondents,* through *observing* and/or *interviewing.*

1.4.2 Overview of methods for measuring preferences

A number of reviews and bibliographies on methods of measuring the preferences of different persons' perception of, and/or preferences for, different types of forest or landscape have been compiled (cf. the references of *Koch* 1977a, p. 57, *Zube et al.* 1982, p. 2, *Hultman* 1983a and *Ribe* 1989.

Common to all of these surveys is their failure to designate any measuring method as being *the* most suitable.

Instead, they often recommend a combination of different measuring methods. In part in an attempt to clarify the reliability and validity of the measures, and in part to reduce the risk of exhausting the person who will carry out assessment.

Methods of preference measurement can be subdivided according to the following criteria (cf. *Koch* 1977a, p. 58 f, and *Craik* 1968):

1. in the first place, according to *acquisition technique/paths of cognition* in methods based on:

    a. secondary data (use of existing sources);
    b. observation;
    c. interviews;

2. in the second place, according to the *form of presentation of the stimulus* - the way in which the stimulus to be assessed by the respondent is presented:

    a. verbal (stimulus is only described verbally);

    b. picture (stimulus is presented as a sketch, painting, photograph, film, or suchlike);

    c. model (stimulus is presented as a model);

    d. direct presentation (respondent receives direct experience of stimulus - in the present case, of the type of forest or landscape);

3. in the third place, according to the *response format.* In other words, according to the form that the respondent's assessment reaction can assume. The response format is dependent on the acquisition technique and its different forms will therefore be mentioned in the following discussion of the advantages and disadvantages of the methods;

4. finally, in the fourth place, according to *which group of people are selected for the measurement,* where this could be a question of samples, e.g. of:

    a. the population;

    b. special interest groups (such as horsemen, hunters, joggers, orienteers, people with disabilities and visitors to selected areas);

    c. special "expert" groups (such as landscape managers, conservation planners, artists and scientists);

    d. other groups formed on the basis of relevant personal characteristics.

The advantages and disadvantages of the different methods will be discussed in the following. Advantages and disadvantages associated with the last subdivision criterion, i.e. for which groups of people should be chosen for the measurement, depend on the individual measuring task. If we wish to draw more general conclusions on the basis of the survey, however, measurements of special "expert" or interest groups' preferences cannot stand alone. Furthermore, we must demand the survey being *representative* of the population segments under observation.

In the following, we shall discuss the advantages and disadvantages of methods based on the different *acquisition techniques/paths of cognition* and their associated *response formats* - and, in its own subsection, the advantages and disadvantages of using different *forms of presenting the stimulus.*

1.4.3 Advantages and disadvantages of methods based on secondary data

When measuring preferences for different types of forest or landscape, secondary data (data that was originally obtained for some other purpose) is used in the following ways:

1. analyses of selected *"expert" groups'* representations of forest and landscape types. Among others, the following expert groups have been considered: artists (such as *Schulin* 1949, *Hauser* 1978, *Stenhøj* 1983 and *Kilian* 1984), poets and authors (such as *Schulin* 1949, *Hauser* 1978, *Svobodová* 1986 and Seedorff 1993), composers (such as *Hauser* 1978), scientists (such as *Schulin* 1949) and advertising people (such as *Stenhøj* 1983 and *Olwig* 1985);

2. analyses of *the general public's* spontaneous written manifestations (such as *Klukas & Duncan* 1967), their (more or less) spontaneous photographs (such as *Cherem & Driver* 1983) or analyses of tree purchases made by garden owners for their own gardens (cf. *Koch* 1977a, p. 68 f);

3. analyses of a number of *preference measurements conducted previously* for the purpose of drawing general conclusions on the population's preferences (such as *Rozsnyay* 1972);

4. analyses of *the forests' symbolic and general cultural significance* (such as *Reunala* 1984 and *Reunala & Virtanen* 1987).

The advantages of these methods are that they can offer potential for expanded interpretations or a more profound understanding of collections of primary data and that they can indicate areas in which continued study is needed (cf. *Olwig* 1985, p. 41).

The disadvantages of the methods derive from lack of control over data acquisition. Measurements based on these methods can therefore rarely satisfy the requirement on representativity. Also, the reliability and validity of measurements can seldom be determined. This means that the results are often difficult to interpret - unambiguously, at any rate.

1.4.4 Advantages and disadvantages of methods based on observing

Two types of *response format* can be of relevance when using *observation* as a data acquisition technique. Or, to put it another way, the assessment reactions of the selected respondents can be subdivided into two main groups:

1. respondents' behaviour;

2. respondents' *pysiological* behaviour (i.e. changes in pupil size, blood pressure, pulse rate, as well as head and eye movements, etc.).

When measuring preferences for different types of forest and landscape, *observing* has been used in the following ways:

1. observing *physiological behaviour* in response to image stimuli.

For instance, *Wenger & Videbeck* (1969) measured the change in pupil size in different people, observed in connection with the presentation of different landscape pictures. The underlying psycho-physiological hypothesis is that, at constant illumination, the pupil will dilate during positive feelings. *Gratzer & McDowell* (1971), *Noton & Stark* (1971) and *Lucio et al.* (1996) have measured eye motion while presenting images in an attempt to determine the elements of the image on which the focus concentrates;

2. observing *physiological behaviour* when stimuli are *presented directly.*

One example of this type of measurement can be found in *Carr & Schissler* (1969), who measured the head and eye movements of road users when driving. This measurement was carried out with the aid of a film camera mounted on the respondent's head, while a prism was used to record two images simultaneously, one in the exact direction of the respondent's gaze and the other of the landscape towards which the respondent's head was turned;

3. observing *behaviour* by *direct presentation* of the stimulus.

Several researchers have attempted to map preferences for different types of forest and landscape on the basis of measurements of *the total utilisation* of a number of different areas (such as *Love* 1964, *Klukas & Duncan* 1967, *Lucas* 1970 and *Lime* 1971). It has emerged, however, that the utilisation of an area depends primarily on the distance to that area and the range of other alternatives available (cf. *Koch* 1977a, p. 64). This method can therefore only be used to gain a relatively coarse indication of the direction of preferences;

4. observing *behaviour* when stimuli are *presented directly* and in conjunction with an *experimentally constructed choice situation.* A few researchers have observed people's behaviour in an experimentally constructed choice situation (e.g. *Heytze* 1975 and 1976a, b and c, *Brown & Hunt* 1969, *Hancock* 1973 and *Haakenstad* 1975). These experiments cover the following factors: (1) access with and without a car; (2) the effect of a sign, (3) quantity of bushes at a camping site, and (4) choice between a path, a ski trail or a road.

The *advantages* of these methods are as follows:

- the interview method, with all its sources of errors (including lack of willingness to respond, or the capability of responding), is avoided;
- some of the methods give direct recording of the respondents' behaviour;
- measurements are normally made to *metric* scales (interval or ratio scales).

The *disadvantages* of methods based on observation are due to the fact that there is not always any immediate relationship between an individual's preferences and the same individual's behaviour. It can be said of these methods that, in general, they are *"... less effective in giving information about a person's beliefs, feelings, motivations, anticipations or future plans; and certainly they provide no information about past behaviour or private behaviours,"* (*Selltiz et al.* 1965, p. 236).

In addition, methods based on observation will often be time-consuming and (partly because of this) it can be difficult to make them representative of a greater whole.

Observation of *physiological behaviour* (pupil dilation, eye movements, etc.) can be carried out in isolation. It must be assumed that these measuring methods influence the respondent and that their validity in the "real world" (their external validity) is limited.

However, we cannot preclude in advance the possibility of finding a physiological behaviour parameter that is a good indicator of the preferences of different people. - E.g. are many people considering body temperature to be a good primary indicator in connection with a relatively complex measurement, i.e. of how sick a person is.

1.4.5 Advantages and disadvantages of methods based on interviewing

Interviewing comprises a number of methods of acquiring data, in which persons are contacted and requested to supply information.

We differentiate between *the personal interview* and *the questionnaire interview.* In *the personal interview,* a person - the interviewer - asks questions which are answered by the interviewee/respondent, while the interviewer records the responses. (Simply "interviewing" is sometimes used to denote this acquisition technique.) In the questionnaire interview, the selected interviewees/respondents read the questions for themselves and write down their responses (sometimes known as the enquête method).

The following response formats are of relevance, when *interviewing* is used as a data acquisition technique:

1. Open
   - direct open,
   - indirect open (including mental maps and construct repertory);

2. Closed
   - dichotomy,
   - multiple choice;

3. Ranking scales (direct scaling)
   - allocation of points,
   - ranking,
   - comparison of pairs;

4. Attitude scales (indirect scaling)
   - Thurstone scale,
   - Likert scale,
   - cumulative scales (such as Guttmann's skalogram);

5. Special scales (refined direct scaling)
   - Q-sorting,
   - semantic differential scale,
   - multidimensional scaling.

By far the greater number of measurements of preferences for different types of forest and landscape are made by interviewing. All of the above *response formats* have been used and all *presentation forms* for stimuli have been tried. This means that there is a number of different combinations of these two subdivision criteria. Table 1 is a compilation of how frequently the different combinations have been used in preference measurements; see *Koch* (1977a, pp. 71-106).

The advantages of methods based on interviewing are self-evident: if we want to know how people assess different stimuli, the obvious thing to do is to ask them. At a more general level, interviewing is considered one of the most usable and fruitful

data acquisition techniques in the social sciences (e.g. *Selltiz et al.* 1965, p. 263, *Galtung* 1969, p. 109 ff., *Svalastoga* 1969, pp. 99 and 163, *Redder et al.* 1970, p. 22, *Boyd & Westfall* 1972, p. 131 f, *Blunch* 1974 and *Hansen* 1979) - *on condition that the technique is applied with reason.* The *disadvantages* are due to the fact that it is difficult to carry out an interview-based survey completely correctly. Experience of this can be summarised with a quotation from an extensive study of the literature and methods, conducted for the U.S. Forest Service:

"... the complexities of using questionnaires for research are often vastly underrated. The popularity of the method often rests on ignorance of associated problems of data analysis, bias, reliability, and validity of results." (Potter et al. 1972, p. 1*).*

Arthur et al. also warn us that:

"... a carefully constructed questionnaire can demand substantial expenditure of time and money. Furthermore, analyzing and interpreting the questionnaires can also be time consuming and costly.

Questionnaires can manipulate public preferences." ([1975], p. 14).

Response *format*	*Presentation media of the stimuli*				
	Verbal	*Picture*[b)]	*Model*	*Direct presentation*	*Total*
Free/Open-ended	18	4	0	2	24
Closed/Fixed-alternative	24	12	0	5	41
Rating scales	10	20	0	5	35
Indirect scales	7	1	0	0	8
Special scales[c]	0	15	1	5	21
Total	**59**	**52**	**1**	**17**	**129**

Table 1: Number of times different research techniques have been used in landscape perception and preference surveys based on questioning [a)]

NOTE:

a. The table only includes the surveys that have been reviewed by Koch (1977a)

b. "Picture" includes: drawings, photographs, slides, films, etc

c. Special scales include: Q-sorting, semantic differential and multidimensional scaling

The many error sources associated with interview-based surveys are described in depth by *Koch* (1977a, pp. 28-56). Apart from this reference, we only wish to mention one frequently-encountered source of error in such surveys: the interviewees must possess the necessary information if they are to give a meaningful response to a given question. *Svalastoga* warns us that:

"... the greatest difficulty resides in the fact that questions that exceed a person's ability to respond are frequently answered by that person all the same. Thus, excessively difficult questions reduce the validity of responses." (1969, p. 101).

One thought-provoking example of this has been described by *Boyd & Westfall* (1972, p. 287): in an interview-based survey, interviewees were asked to state their attitude to a non-existent *"Metallic Metals Act"*, to provide a control. About 70% of the persons responded with one of the four apparently meaningful alternatives, whereas only about 30% used the fifth alternative, which indicated that they were unaware of the act.
There is a rich flora of similar examples in interview-based surveys of public preferences for different types of forest and landscape. We have chosen a single example to demonstrate some of the shortcomings and errors that can occur. It is taken from *Degener's* pioneering survey, conducted in 1963; as it was published as one of the first of its kind in Europe, it is only natural that we find today that it contained various methodological deficiencies. Two of the most central questions of the survey were as follows (cf. *Degener* 1963, p. 537):

		yes	no
"5.	Do you enjoy walking in		
	a. a stand of beech	[ ]	[ ]
	b. an old stand of oak	[ ]	[ ]
	c. a stand of spruce	[ ]	[ ]
6.	Would you like a mixed stand, with *different* types of tree, of *different* ages and with intervening glades?	[ ]	[ ]"

These two questions are ambiguous, they set high requirements on the respondents' knowledge of the forest and, moreover, they are leading questions. In question 5, the oak stand is described as old. In question 6, respondents must imagine a type of stand that is not encountered in many places in Denmark, while they must adopt an attitude to three factors: mixed-species stands, several ages/storeys and glades. Minor clear-cuttings and small glades are in any case synonymous and - as pointed out by *Arthur et al.* ([1975] p. 14) - it should be assumed that the answer will depend on the designation used. Finally, the formulation of the questions ("Do you enjoy ..."/"Would you like ...") makes it easy to tick all four "yes" boxes, which is in fact what just under half of the respondents did.
For a fundamental introduction to surveys based on interviews see, e.g. *Dillman* (1978), *Sudman & Bradburn* (1982), *Rossi et al.* (1983), *Patton* (1990), and *Ryan* (1995).

1.4.6 Advantages and disadvantages of different forms of presentation

The stimuli to be assessed by the persons selected can - as mentioned above - be presented in the following ways:

1. VERBAL (stimulus only described verbally);
2. PICTURE (stimulus presented as a sketch, painting, photograph, film, or suchlike);
3. MODEL (stimulus presented as a model);
4. DIRECT PRESENTATION (respondent receives direct experience of stimulus - in this case, of forest or landscape type).

As mentioned in the foregoing subsection, it must be a requirement that the interviewees possess the information necessary to give meaningful answers to the questions set. Certain survey subjects/stimuli must be assumed to be so familiar that they can be described relatively unambiguously in words, e.g. "A hare", "A cyclist" and "A family walking in the forest with their dog on a leash". On the other hand, ordinary interviewees cannot be expected to have any knowledge of other subjects, such as forest regeneration and formation, selection of tree species and tending of stands.

The less familiar an interviewee is with the subject of a survey, the better the description required if the measurement is to be valid. All other things being equal, DIRECT PRESENTATION - the interviewee's own experience of the subject in the real world - must be considered to provide the best conceivable basis for his or her assessment. However, as we wish to study the *public's* assessment of different types of forest and landscape, DIRECT PRESENTATION would require us to transport a *representative* sample of the public to various locations. This would introduce a number of difficulties, which have yet to be overcome (cf. *Koch* 1977a, p. 103). The surveys conducted using DIRECT PRESENTATION (cf. Table 1) have all used special - non-representative - groups.

Since the survey subjects are tied to a locality, it is necessary to reproduce them in a form that can be transported to a *representative* sample of the public. This can be achieved through MODEL, PICTURE or VERBAL stimuli. It is to be generally expected that the costs of producing and transporting these three forms of presentation to a representative sample of the public decline in the order mentioned, i.e. MODEL, PICTURE, VERBAL. But an interviewee's basis for assessment must also be generally expected to become worse in the same sequence. Thus, there is a relationship between the *form of presentation of a stimulus* and the ease with which it can be made to yield valid and representative measurements. This relationship is illustrated in Fig. 1.

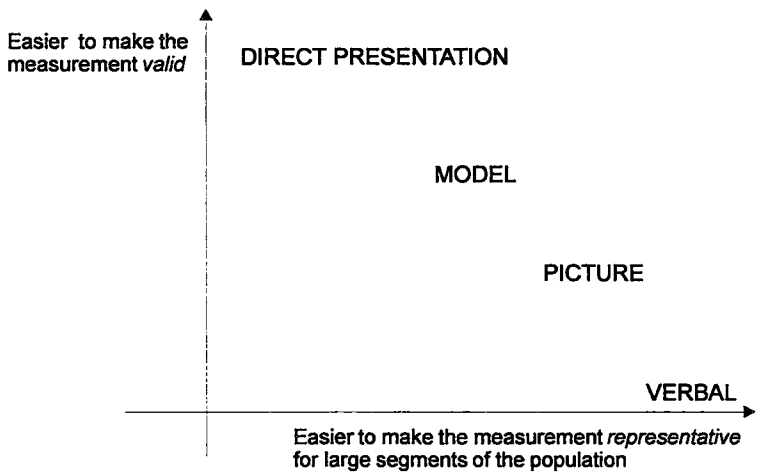

Figure 1: The relationship between the presentation media of the stimuli and how easy it is to make the measurement valid and representative.

Note: "Picture" includes drawings, photographs, slides, films, etc.

The above relationship means that it is necessary to *find a balance* between the requirements on measurement validity and representativity (cf. Section 1.3). To our knowledge no surveys that have attempted to satisfy the requirement on representativity have used DIRECT PRESENTATION. And to the authors' knowledge, the MODEL stimulus has only been used in a single preference measurement (*Sorte* 1975). We do not consider that a MODEL provides a satisfactory basis for the assessment of different types of forest and landscape, although the contrary is probably the case when assessing buildings and suchlike.

By far the greatest number of preference measurements have used PICTURE or VERBAL stimuli, cf. Table 1. PICTURE stimuli have usually been used in cases where it has been considered that VERBAL stimuli fail to give interviewees a sufficiently good basis for assessment. PICTURE stimuli have the following *advantages*:

1. insignificant demands on the interviewee's knowledge of the subject, as the image transfers a large quantity of information to the viewer;

2. it is possible to contact a representative sample of a well-defined population;

3. it is possible to assess not only the present stimuli but also potential stimuli (e.g. photographed elsewhere or manipulated);

4. preference differences due to seasonal variation can be measured at one and the same time;

5. assumed to be relatively good at arousing the interest of interviewees.

And the following *disadvantages*:

1. a picture is a distillate of reality, from which the most significant preference-determining factors can be missing;

2. the risk of subjectivity when recording;

3. a single disturbing factor can be decisive to assessment;

4. the material can be relatively difficult/costly to reproduce.

The first disadvantage must be considered the most serious. As *Poul Lorenzen* wrote in a critique of the planning of the Danish surveys presented here (Section 2.2):

"*I have been thinking about 'What do you prefer to meet in the woods?' The main accent is on vision, which is also our most important sense.*

Flavour is considered under 'berries and mushrooms'; although, as far as I am concerned, the senses of feeling, smell and hearing are also meaningful during a walk in the forest.

Feeling. It is stormy, windy and cold, pouring with rain or the snow is drifting. But shelter can be found if only one enters the forest - or cool and pleasant shade in deciduous forest on a hot summer day.

'Le nez c'est la memoire', as they say in France, and with good reason. The scent of the forest, the resinous scent of coniferous forest. The scent of a forest floor covered with woodruff or anemones. The scent of bird cherry or mountain ash. The scent of the topsoil or the spicy scent of a forest bog, or the breeze blowing from flowering heather, etc. And the sense of hearing. The song of the birds, the belling of a stag on dark autumn nights, the soughing of the wind in the trees, quite different in deciduous and coniferous forest, or in gale and breeze.

The effects of the forest on the open senses are manifold." (*Lorenzen* 1977).

This is also why several surveys have been conducted in order to elucidate whether or not it is possible to use PICTURE stimuli to obtain valid measurements of preferences for different types of forest and landscape. Most of the so-called *validity tests* have been carried out by comparing the results obtained from PICTURE stimuli to those obtained from DIRECT PRESENTATION. These validity tests have been reviewed by *Koch* (1977a, pp. 86-89) and in a later, more comprehensive publication of *Hultman* (1983a). *Koch* reviews 10 surveys and *Hultman,* 24. The conclusion of all of these surveys, as well as *Koch* (1977a, p. 108) and *Hultman* (1983a, p. 87), is that photographs, regardless of whether they are in colour or black-and-white, *can* provide a basis for fully valid measurements of preferences for different types of forest and landscape.

We must emphasise that this conclusion cannot be generalised uncritically. Care must obviously be given when designing PICTURE stimuli, so that they convey to the interviewee the information necessary for giving a meaningful reply to the questions set. *Hultman* details the factors of which we should be aware (1983a). Apart from this, validity testing should be carried out to determine whether or not the stimuli used can yield valid measurements (cf., e.g. *Ray* 1979, *Hansen* 1979, p. 51 ff., and *Bohrnstedt* 1983).

Conclusion

We can conclude that there is a number of different methods for making preference measurements; but that none of them can be considered to be the generally most suitable method.

Until there is a decisive scientific breakthrough, we can only choose the best known method and adapt as well as possible to the task in hand, as well as using combinations of different survey methods so that they can supplement and/or provide checks on each other. That is what has been attempted in the surveys presented in the following section.

2. Survey methodology

This section describes how the preference surveys developed at the Danish Forest and Landscape Research Institute are implemented (*Koch & Jensen* 1988). Data acquisition has been carried out in two national interview-based surveys in 1977/78, which embraced 3087 persons representing the adult population. These *two surveys* were each conducted using their own methods:

1. the *Experimental Method,* based on postal questionnaires (Section 2.2) and

2. the *Standard Assessment Method (STA-Method),* based on personal interviews onducted in the homes of selected persons (Section 2.3).

2.1 Population and sampling technique

The Danish population is required to register births, marriages, deaths and changes of address. This provides an excellent *sampling frame*, with details of the name, age, sex, address, marital status and occupation of the Danish population (the Civil Register). For the survey, a systematic gross random sample consisting of 3,087 individuals, born in the period 1900-1961, has been drawn from this sampling frame.

Using stratified random sampling, this sample was distributed over the 2 surveys: a) the Experimental Method, and b) the STA-Method (cf. Table 2).

2.2 Collection of responses by postal questionnaires (the experimental method)

2.2.1 Overview of the method

In the *Experimental Method,* respondents assess 52 *black-and-white photographs*, which, taken in pairs or in groups, only differ in respect of a single factor. Moreover, a series of less ambiguous, well-defined subjects, which are only described verbally - a total of 100 *verbal stimuli* - are assessed. Assessment is carried out by each individual *ranking* 7 randomly selected photographs and 7 randomly selected verbal stimuli. The data collection was distributed over one year.

This method, which was developed by *Koch* (1974, 1977a and 1977b), distinguishes itself by its experimental design and by its ability to embrace many survey subjects. Since the representation of these subjects, as photographs or as verbal stimuli, has been chosen subjectively, the validity of the results can only be assessed with partial objectivity. The Standard Assessment Method (STA-Method) described in Section 2.3 has therefore been used to elucidate and check the results of the Experimental Method, from the standpoints of preferences for tree species and preferences for facilities for forest recreation.

2.2.2 Data collection through one year

As has already been mentioned, it must be assumed that the season is a factor that influences preferences for different types of forest and landscape. There are two alternatives, if results are desired which can be generalised for the conditions of an entire year, i.e. either to let the interviewee generalise for the period or to ask at representatively distributed times. The former approach must be assumed to diminish the results' validity (external validity).
That is why the postal questionnaires used for the Experimental Method were sent out in 12 lots on a randomly sampled day in each month, in the period from April 1977 to April 1978.

2.2.3 Postal questionnaire

An attempt was made to increase the response percentage, through:

1. care in the formulation of the packet's physical appeal. The packets were mailed as letters in brown envelopes, with white address labels and the project logo printed in green;

2. care in the design of the verbal prompting to respond;

3. stamped, addressed envelope for replies (white envelope, green printing);

4. brief and simple questionnaire;

5. potential personal gain for respondents (lottery);

6. the use of up to 3 reminders, sent 2, 3 and 5 weeks after the date of sending the questionnaire.

2.2.4 General notes on selection of survey subjects

When choosing the subjects to be assessed by the selected persons, weight was attached to: (1) whether or not the subject could be expected to exert influence on the experience of the forest visitor, (2) whether or not it has any commercial or socio-economic significance, and/or (3) whether or not the given conditions can be regulated by the forest and landscape manager. A number of survey subjects can be considered relevant on the basis of these criteria. A review of relevant survey subjects can be found in *Koch* (1977b, pp. 6-10). Although the survey were designed to include by far the greater part of these subjects, forest regeneration and formation, choice of tree species and the extent and type of facilities for forest recreation are nonetheless considered to be the most significant survey subjects. They have therefore been surveyed with particular care through the use of the Experimental *and* the STA-Method. In the Experimental Method, the survey subjects have been assessed on the basis of black-and-white photographs and/or verbal stimuli.

2.2.5 Black-and-white photographs

The survey subjects that cannot be described sufficiently unambiguously and defined clearly in words are assessed on the basis of black-and-white photographs (cf. the discussion of the different forms of presentation). The *Experimental Method* means that the photographs are considered in pairs or groups which, to the extent

possible, only differ in one single aspect, i.e. the aspect to be assessed. Thus, the photographs are grouped in *"blocks"*, which were taken with a view to direct mutual comparison (see Photo. 1 for an example of such a "block"). Apart from this, all photographs can obviously be compared to each other, although conclusions must be drawn with greater care as a result of the less standardised conditions of recording the images. The photographs were taken by the authors (*Koch*).

When taking the photographs, great weight was attached to ensuring that photographs in a given "block" are *as uniform as possible* - apart from the factor/subject to be assessed. The most important considerations here should be mentioned:

1. in order to ensure identical natural shadowing, all photographs in a "block" were taken within one hour of each other and in the same direction in relation to the magnetic North Pole (the maximum permissible deviation from this was 10°);

2. the photographs of an individual "block" were taken under similar weather conditions;

3. the same type of film was endeavoured used for all photographs (KODAK TRI-X PAN, 27 DIN/400 ASA);

4. all photographs in a "block" were taken at the same aperture and distance as this ensures identical depth of field in all photographs;

5. we endeavoured to make the composition of the pictures as uniform as possible;

6. the same camera and same lens (*f* 2.8/50 mm), same lens hood and filter (UV and yellow-green filters) were used. The use of a weak wide-angle lens was contemplated but later discarded because: (a) it must be assumed that photographs taken with a standard 50 mm lens are the most familiar; (b) no survey has determined the type of lens that is best suited to preference measurements (cf. *Koch* 1977a and *Hultman* 1983a, p. 87); (c) a 50 mm lens has an angle of view that corresponds to what we see with bifocal vision;

7. in order to emphasise certain details of the subject, photographs were taken with a high depth of field, which necessitated a small aperture. This decision was partially responsible for the choice of a fast film and the use of a tripod and cable release;

8. retouching was only used in a few cases, for instance, the individual numbers on the trees have been removed in two photograph.

The authors consider the motifs chosen to be representative of the subjects to be assessed. This brings an element of subjectivity to the method. Unconscious affinities and antipathies can have had some impact on the choice of locality.

The reader is referred to Appendix B.2 in *Koch & Jensen* (1988), in which the photographs are reproduced in the same size and quality as mailed with the questionnaires.

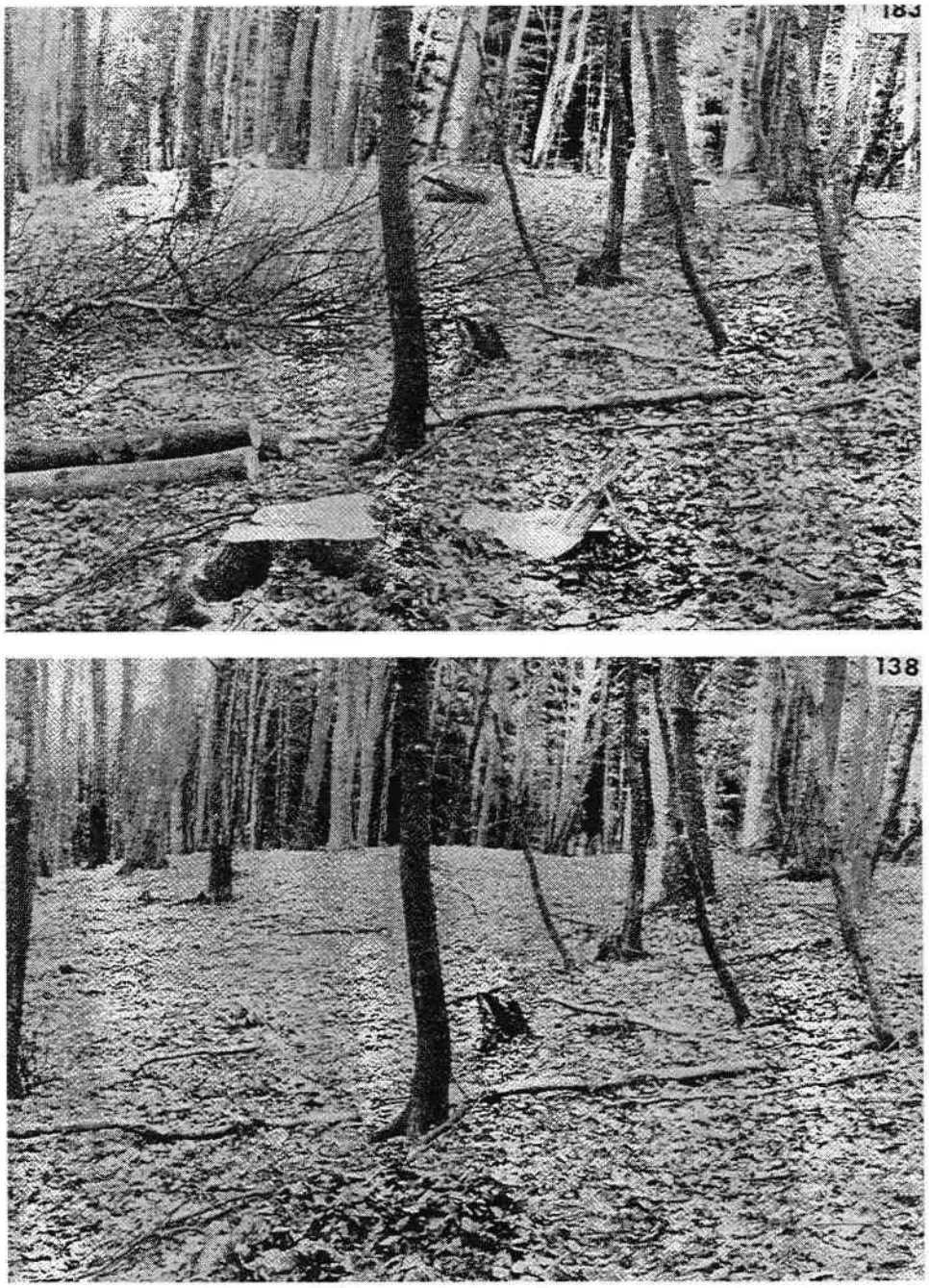

Photo 1: An example of a "block" of photographs from the experimental method: Beech forest with and without logs and branches.

2.2.6 Verbal stimuli

A number of survey subjects have been assessed solely on the basis of verbal formulations, i.e. the so-called "verbal stimuli". This has happened when the subjects can be relatively unambiguously and clearly defined in words. Thus, it has been assumed that such stimuli as "A hare", "A cyclist" and "A family walking in the forest with their dog on a leash" are familiar stimuli, which are perceived relatively unambiguously by all of the interviewees.

Certain survey subjects have been assessed on the basis of a photograph *and* a verbal stimulus (e.g. a bench, a horseman, a fence around some young trees, etc.). This makes it possible to perform mutual checks on the two methods.

In most cases - but not as obviously as in the case of the photographs - the verbal stimuli were designed according to the *Experimental Method:* they belong in a "block" of stimuli that deviate only with respect to a single factor, i.e. that which is to be assessed.

The verbal stimuli were printed in green, on yellow cards of the same size as the black-and-white photographs (98 x 134 mm).

We sought the assessment of a total of 100 verbal stimuli (cf. *Koch & Jensen* 1988, Appendix B.4).

2.2.7 Raning

The following techniques were used to facilitate elucidation of the public's preferences for a large number of survey subjects:

Question 10A: a total of 52 black-and-white photographs of different forest environments were studied. Of these, 7 photographs were randomly selected for each interviewee and appended to the questionnaire in a red envelope. Guided by the explanations on the questionnaire, interviewees were asked to rank the 7 photographs according to the criterion:

"Which wodland environment do you prefer to visit?"

Question 10B: a total of 100 verbal stimuli were studied. Of these, 7 verbal stimuli were randomly selected for each interviewee and - printed on yellow cards - appended to the questionnaire in a blue envelope. Guided by the explanations on the questionnaire, interviewees were asked to rank the text on the 7 cards according to the criterion:

"What do you prefer to meet in the forest?"

Thus, the survey produces a series of independent *rankings,* made by a representative selection of the public, of a number of different subjects (presented as black-and-white photographs or verbal stimuli), in a number of different, randomly selected combinations. On the average, each photograph was ranked about 335 times by the respondents and each verbal stimulus, about 175 times.

Thus, we have obtained a basis for comparing the internal ranking of the photographs and of the verbal stimuli.

The reason for using only 7 photographs and 7 verbal stimuli/respondent is that studies have shown that people experience difficulty in ranking a greater number of objects on the same occasion (cf. *Miller* 1956 and *Koch* 1977a, p. 43).

The photographs and verbal-stimulus cards are each numbered with a 3-digit number. The first digit was added to reduce the chance of the numbering affecting the assessment. For the same reason, the photographs that belong to a given "block" are marked as far as possible with the same digits, only in different sequences (cf., e.g. Fig. 2, Nos. 138 and 183).

"What assessment criteria did respondents apply? "

It was implicitly assumed that the stimuli would only be assessed in a single dimension.

This is probably an oversimplification. The experience of nature should be considered to be so complex a phenomenon that each individual assesses this experience on the basis of several criteria, for instance, aesthetic value and functionalism. If we are to attempt to answer the vital question of *why* a particular type of forest or landscape is preferred, it is necessary to determine these assessment criteria.

2.3 Collection of responses by personal interviews (the Standard Assessment Method (the STA-Method))

2.3.1 Overview of the method

The *reason* for using the Standard Assessment Method (STA-Method) is to elaborate on and check the results given by the Experimental Method, from the standpoints of preference for tree species and facilities for forest recreation. In this case, the disadvantages of the Experimental Method are that the individual subjects are only represented by a *few black-and-white* photographs (and/or verbal stimuli), and the recording locality (or design of the verbal stimuli) was determined subjectively. Use of the STA-Method cancels these disadvantages.

The SBE Method (Scenic Beauty Estimation Method) was developed by *Daniel & Boster* (1976) and has found broad acceptance in USA, in particular (cf., e.g. *Brown & Daniel* 1984, p. 3 ff., and *Buhyoff et al.* 1986, p. 771). It has been modified for the present survey by *Koch* (1977b), who used the designation "Standard Assessment Method".

In this method, 216 persons representing the population have been shown 80 *colour slides,* to which they were asked to assign points. From the standpoint of recording *locality,* these images were selected at random (based on UTM co-ordinates) from the set of possible images that can be obtained in four types of

landscape: DECIDUOUS FOREST, CONIFEROUS FOREST, the COUNTRYSIDE and forest with FACILITIES FOR FOREST RECREATION.
Concerning the *point in time* of recording, one set of images was photographed at different times during the winter half of the year (defined in this context as from the end of defoliation until bursting into leaf), and the other set, during the summer half of the year. Each type of landscape is thus represented by 20 slides taken in the winter and 20 taken in the summer. However, the special spring and autumn colours of DECIDUOUS FOREST s are not specifically represented in the survey.

The photographs were taken in the *weather conditions* prevailing when the site was visited. However, photographs were not taken earlier than 2 hours after sunrise or later than two hours before sunset, in order to avoid heavy shadowing of the images.

All pictures were taken using the following strictly identical photographic parameters: identical film (KODACHROME 64), identical film emulsion numbers, a fixed aperture setting of *f* 8 and, thus, a fixed depth of field, identical procedures for light metering and exactly the same equipment as was mentioned in the discussion of the Experimental Method.

2.3.2 Distribution of interviewing over summer and winter

Since we must assume that people's preferences change over time, the personal interviews at the homes of the respondents were distributed over the year, so that the 80 slides that depict the winter half of the year were used in the winter, and conversely for the summer pictures.

The personal interviews at the respondents' residences used for the STA-Method were carried out from November 1977 to November 1978.

2.3.3 Interview form

With the exception of questions associated with the STA-Method, the form used for the interviews was largely identical to the postal questionnaire, which was used in the Experimental Method. The questions of the interview form were read out by the interviewer, who also filled in the form.

2.3.4 Showing of slides and interviewing

The slides were shown in conjunction with the personal interview at the interviewee's home. A KINDERMANN DAYLIGHT PROJECTOR AV 100 was used, which has a screen for daylight viewing in the format 12 x 18 cm. The interviewees operated the projector for themselves, thus determining the time for which they could view each slide. The slides were shown to each respondent in a *random sequence* to prevent the sequence from influencing the assessment of each individual picture.

2.3.5 Point scale

The respondents awarded points (on a scale of 1 to 10) to each slide. Instructions on how to award the points were given in the form of a slide, which is shown in Fig. 3 and which was read out by the interviewer.

In principle, we have no knowledge of which assessment criteria the respondents applied, cf. the discussion earlier.

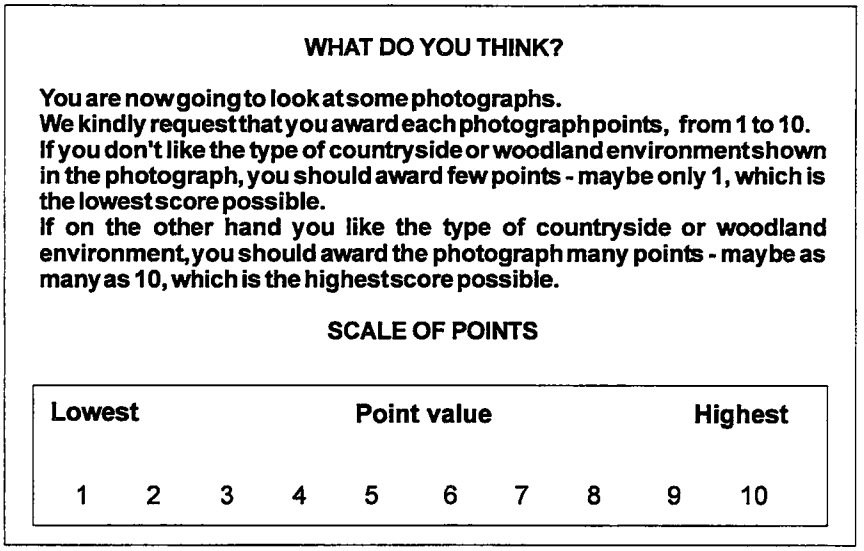

Figure 2: Instructions on the awarding of points to the STA colour slides was given with this slide, which opened the slide show.

2.3.6 Stability of opinion

In order to study the extent to which it is possible to influence preferences for DECIDUOUS/CONIFEROUS FOREST, the respondents were exposed to the following five promotions, i.e. factual promotion for deciduous, factual promotion for coniferous, emotional promotion for deciduous, emotional promotion for coniferous and no promotion. Promotion was achieved by showing a slide with one of the texts shown in Fig. 3. This slide was inserted immediately after the slide shown in Fig. 2.

General opening:	**The reason for this awarding of points is that we want to know how highly ...**
Factual for DECIDUOUS:	**... you appreciate stands of deciduous trees, which, among other things, provide this country with wood for furniture.**
Emotional for DECIDUOUS:	**... you appreciate Denmark's national tree, the beech, which is about to be replaced by other tree species.**
Factual for CONIFEROUS:	**... you appreciate stands of conifers, which, among other things, provide this country with timber for house building.**
Emotional for CONIFEROUS:	**... you appreciate stands of spruce, which play a decisive part in providing Denmark with Christmas trees and timber and, thus, in improving the employment situation andbalance of payments.**

Figure 3: The various promotions tested to see the effect on preferences for DECIDUOUS/CONIFEROUS FOREST.

2.4 Processing and analysis of data

2.4.1 Data processing

Data merging, error tracing and analysis were primarily carried out using SAS (Statistical Analysis System), (SAS Institute Inc., 1982a, b and 1985). A few analyses were conducted using SPSS (Statistical Package for the Social Sciences), (Nie et al. 1975 and Nie & Hull 1977).

2.4.2 Analysis of data obtained by the experimental method

When analysing the data obtained by the Experimental Method, 7 points were awarded to the photograph/card that received the highest ranking, 6 points to the next highest, and so on, down to 1 point for the photograph/card that received the lowest ranking. The mean point value for each photograph/card was then calculated, after which these means were compared to each other by classical analysis of variance. However, this procedure is based on the assumption that the data was measured on an *interval scale,* whereas ranking of the seven photographs/cards only gives a result measured on an *ordinal scale.* That is why - for all 21 blocks of black-and-white photographs - the results of classical analysis of variance are compared to the results of three non-parametric statistical tests, which were devised for comparing mean values measured on an ordinal scale. Since the same results are obtained from all of these analyses, it was decided to apply classical analysis of the variance to the data derived from the Experimental Method.

2.4.3 Analysis of data obtained by the sta-method

The most important advantage of the STA-Method is that objectively (randomly) selected colour slides are used and that many pictures are used to represent each individual subject (the individual landscape types). The most significant disadvantages are that the method demands considerable resources, only yields assessments of a few subjects and that the underlying SBE Method is unclear and poorly documented (cf. *Daniel & Boster* 1976 and *Daniel* 1980, personal communication). To counteract the latter disadvantage, a major study of the choice of analytical methods in connection with STA surveys was launched in 1978. This work was done by *Søren Andersen* and *Mats Rudemo,* of the Royal Veterinary and Agricultural University, Copenhagen, and is documented separately (cf. *Koch & Jensen* 1988, Appendix A.3).

The main conclusions of this study are reviewed below. *Daniel & Boster's* analytical methods are based on individual transformation of the points awarded for each respondent and type of landscape. Starting with a *reference* (which, in the Danish survey, was planned to be the COUNTRYSIDE) a null point is then determined and, thus, an *interval scale,* to facilitate the measurement of preferences. More detailed analyses of this procedure revealed, for instance, the following disadvantages:

1. many observations are required if we are to make a completely unbiased estimate of an individual transformation of the points awarded for each respondent and type of landscape;

2. this should be considered an unnecessary complication, since analysis of variance is relatively robust, as far as deviation from normality is concerned (cf., e.g. *Rudemo* 1979, p. 95 ff.) ;

3. by including a reference (in this case, the COUNTRYSIDE) in a comparison, the standard deviation becomes greater than in the case of a direct comparison between two types of landscape (e.g. DECIDUOUS FOREST - CONIFEROUS FOREST).

Investigation has however yielded the following methods, which are applied in analysing the data obtained from the STA-survey: The mean number of points awarded to each type of landscape for each respondent in the STA-survey is calculated. The four types of landscape are then compared in pairs, by finding for each person the difference between the calculated mean numbers of points awarded to two types of landscape, after which these differences are subjected to analysis of variance.

As in the case of the Experimental Method, a parametric statistical method is applied to the *interval data,* despite the fact that the point values can only be said to have been measured on an *ordinal scale.* This method was therefore compared to other methods, including *Daniel & Boster's* method. The methods used yielded similar results (cf. *Koch & Jensen* 1988, Appendix A.3).

2.5 Sources of error

Errors of different types are associated with this type of surveys:

1. sampling error;
2. non-response error;
3. measurement error;
4. errors due to coding, editing and tabulating.

These types of error will be discussed in greater detail in this section; see also the more general discussion in the foregoing.

2.5.1 Sampling error

This type of error can be calculated objectively. Since the probability of participation in the survey was known in advance for all persons in the defined population, it is possible to calculate the uncertainty that would be introduced by considering only a single sample out of a large number of possible samples. The sampling error can be used to predict the precision (confidence interval) with which the chosen sample reflects the average result of all possible samples. Thus, if a frequency (a percentage) is found in the sample used, the corresponding mean of all possible samples can be predicted with 95% confidence to lie within an interval of four times the sampling error, distributed symmetrically around the frequency that was found in the sample used.

The absolute *sampling error* of the two surveys can be *assumed* with 95% confidence *to be better than ±2% of the frequencies found,* as far as the Experimental Method is concerned, and *±10%,* for the STA-Method (cf. *Koch* 1978, pp. 303 and 364 f).

2.5.2 Non-response

Non-response can be subdivided into two types:

1. interview non-response, which occurs when the respondent fails to respond to the interview in its entirety;
2. partial non-response, which occurs when the respondent fails to respond, or responds incorrectly/incomprehensibly, to one or more questions.

From the standpoint of willingness and/or ability to respond, the persons who fail to respond differ markedly from the respondents. Non-respondents must therefore be assumed to differ from respondents, from the standpoint of the conditions studied. This error source is often the cause of significant systematic errors in interview-based surveys.

This is the reason for the great care that was taken to derive an answer from the chosen sample. The non-response percentages of the two surveys, and thus the response percentages, are shown in Table 2.

The response percentages that were attained are considered satisfactory. The high response percentages are without any doubt due to a combination of various factors, including the subject of the surveys.

To determine whether or not non-response destroys the "representativity" of the samples, the distribution of all respondents over the most vital grouping factors has been compared to the distribution of the population. As it has not been possible to discern any significant differences, it has been assumed that the *respondents* (the realised sample) *represent the defined population.*
Non-response error achieves its *maximum* effect when all of the persons who fail to respond to a particular question diverge dramatically in a single, identical aspect from the persons who respond. *Thus, interview non-response can cause a maximum - and quite unlikely - absolute error of 10.6% in the frequencies found by the Experimental Method and of 12.1% in the frequencies found by the STA-Method.*

Gross random sample		3087
Reduction of the population by death and emigration before distribution on surveys		45
Net random sample (I)		3042
	Experimental	**STA**
Distribution on 2 surveys	2826	216
Reduction of the population by death and emigration before contact	6	1
Net random sample (II)	2820	215
Number of non-respondents	300	26
Number of respondents	2520	189
Response percentage	**89.4%**	**87.9%**

Table 2: Response percentages of the two surveys

For any given question, the *total non-response* is equal to the *interview non-response* plus any missing responses to that question, i.e. the so-called *partial* non-response. The partial non-response was extremely small for all questions in the survey - and often equal to zero in the case of the STA-Method. Concerning the primary questions of the Experimental Method, the *total non-response* was 13.7%, whereas the *total non-response* for the primary questions of the STA-Method can be calculated as 14.0%.

2.5.3 Measurement method

The type of information can constitute a major source of systematic measurement errors, since the response of the interviewee can be consciously or unconsciously biased.

Information on the *external status* of interviewees - in the case of the two surveys, for instance, their sex, age, occupation, place of residence and the availability of certain goods in the home, should be considered to be relatively precise, as the interviewee would often be aware of the possibility of a check. Moreover, much of this information is derived from the Civil Register, which is considered to contain very few errors.

The situation is quite different where information on *behaviour* is concerned. In the two surveys, this information concerned the following topics: date of latest visit to the forest, choice of forest area, activity in forest, duration of visit, duration, means and length of transportation, size of group and whether or not the interviewee is a horseman, hunter or jogger. Where these circumstances are concerned, the following errors can occur:

1. difficulty in defining a specific type of behaviour in the questions;

2. defects in the interviewee's memory and/or a need to generalise and idealise (including exaggeration or strategic responses);

3. limited opportunities for checking, of which we must assume that the interviewee is aware.

The risk of generalisation in connection with the information on behaviour is limited, since information on the *latest visit to the forest* is requested. Requirements set on the memory of the interviewee are also low since only about a quarter of these forest visits took place more than 2 months earlier. The risks of idealisation and misunderstanding cannot be precluded.

It is even more difficult to obtain information on *preferences* with high precision as only the interviewee is able to supply the desired information. Furthermore, it is difficult to differentiate objectively between a considered opinion and an opinion adopted in haste. Finally, as far as this information is concerned, there is considerable risk of generalisation, idealisation and strategic responses.

Only one type of information is more difficult to collect than information on preferences, i.e. information on the *causes and motivations* that underlie an action or preference. Such information has *not* been collected in these two surveys. This is not because it would be uninteresting to know the motivations for a given

preference, but because it was considered too difficult to collect reliable, valid information on the causes and motivations underlying an action or preference.

As far as the *Experimental Method* is concerned, measuring errors can also be caused because some person other than the selected interviewee has filled in the questionnaire.

As far as the *STA-Method* is concerned, measuring errors can also be due to the *interviewer effect.* This effect should be understood as the bias which the interviewer consciously or unconsciously introduces into the process of collecting data.We can differentiate between: (1) selection error (another person is interviewed instead of the chosen interviewee); (2) "question" error (the question is ignored, asked incorrectly and/or pretentiously) and (3) recording error (especially in connection with open questions). Similarly, it has been shown that responses can depend on the interviewer's: (1) appearance (e.g. sex, age, race, dress, language and behaviour), (2) ideology (e.g. political, economic, social and religious attitudes) and (3) expectations (cf. *Koch* 1977a, p. 51 and *Bradburn* 1983, p. 310 ff.).

We have attempted to limit the interview effect by careful instruction of the interviewers and by allocating interviewees to each interviewer at random, similarly distributed over the seasons (summer and winter) and regions (West Jutland, Copenhagen and the rest of Denmark). Nevertheless, it was possible to discern a significant interviewer effect in 6 of the 14 comparisons of pairs of different types of landscape that were carried out according to the STA-Method. Since the differences are small and are not of a systematic nature, this source of error was considered to be of only minor significance, even though the reason for it is not known.

Where *measurement errors* are concerned, it is in general impossible to quantify in an objective manner. It is only possible to *estimate* their trend and magnitude. We have attempted to minimise measurement errors by careful design of the questionnaire and interview form, by careful instruction of the two interviewers and, as far as possible, by trying to avoid any direct influence on the collecting of data. Moreover, several different survey methods were used to facilitate mutual checking and, in the case of the Experimental Method, several control questions were built into its design. A number of validity tests have therefore been implemented, e.g. criterion-related validity (predictive- and concurrent-validity), content-validity and construct-validity (*Koch & Jensen* 1988, p. 405 ff.). Due to these precautions, we conclude that the surveys are not generally encumbered by large measurement errors.

2.5.4 Data processing and analytical methods

Punch checks have contributed to the fact that it has only been possible to detect a few punching errors, despite an thorough search for errors. The actual processing of the data was carried out with well-reputed, proven statistical program packages (SAS and SPSS). *It is therefore considered improbable that any significant systematic errors could have intruded in connection with the processing and analysis of the data.*

However, we must emphasise that the analytical method applied can cause readers to commit serious errors of interpretation: in studies of this nature, which possess a

descriptive/comparative character, it is *not* possible to say anything about cause and effect, since other variables can interact decisively with the variable that is believed to "explain" an observed relationship (see, e.g. *Rosenberg* 1968, *Zeisel* 1968, p. 118 ff., and *Koch* 1977a, p. 21 ff.). We can only guess at the reason when, for instance, it has been ascertained that "Edible mushrooms" are more highly esteemed by youngsters than by older people. When, in addition, so many statistical tests have been carried out as is the case here, some of them *must* exhibit significance (cf., e.g. *Nie et al.* 1975, p. 222 and *Hilden* 1980). Thus, the presence of statistical significance should not be over-interpreted. The analytical method itself can lead to an over-interpretation of the results that the analyses cannot support, with consequential errors of interpretation.

3. Results

A selection of the population's *mean* assessments is reviewed in the following. If a landscape manager merely wishes to satisfy the "average man", he will only satisfy a *few* people; whereas a *variegated* range of alternatives, which is in harmony with the surroundings and the *differing* desires of visitors, can satisfy far more people.

That is why the surveys includes results for a series of different groups of the population, including results relating to the regional and seasonal variation of the public's preferences, as well as results for different types of forest visitor, (cf. *Koch & Jensen* 1988, Appendix B).

Bearing these general reservations in mind, a selection of the results is presented in the following, grouped according to the character of the *stimuli* that can be expected to influence the quality of people's recreational activities.

3.1 Environment-related influences, which in this context are the influences over which the landscape manager normally has no control (e.g. aircraft noise and climate)

This group of subjects has only been surveyed through a single verbal stimulus: Tranquillity".

We consider it remarkable that this stimulus attained the *highest* mean assessment of all of the 100 verbal stimuli used. The interpretation of this result is however complex: it can hardly be merely a question of physical silence; is not, for instance, the song of a bird consistent with "tranquillity?" Does this result perhaps actually say more about an important *reason* for forest visits than could be revealed by several more direct questions? - although our understanding of the concept of "Tranquillity" varies of course, for instance, from person to person, from place to place and from time to time.

3.2 Management-related influences, which in this context are influences over which the landscape manager can exercise direct control, as the main accent is on the different problems encountered in *forest* management

1. *Nature in general:* according to the *mean opinion,* the FOREST is preferred to the COUNTRYSIDE *in the winter.* This result applies, regardless of whether we consider DECIDUOUS FOREST, CONIFEROUS FOREST or a forest that has FACILITIES for forest recreation. *In the summer* - and once again on the basis of the mean opinion - DECIDUOUS FOREST is preferred to the COUNTRYSIDE; there is no significant difference between the ranking of a forest with FACILITIES for forest recreation and the COUNTRYSIDE; whereas the COUNTRYSIDE ranks higher in preference than CONIFEROUS FOREST. We must once more emphasise the fact that this is a question of *mean opinions,* based on the assessment by a representative sample of the population (16-77 years of age) of 20 objectively selected colour slides representing the four types of landscape, in summer and winter alike (the STA-Method).

   A lake and watercourse are extremely popular landscape elements in the forest, more popular than *a bog.*Three alternatives, which a landscape manager can choose between for a small wetland in a forest, have been studied using black-and-white photographs (the Experimental Method): natural *overgrowing,* preservation or establishment of a *forest lake* or draining and *planting with ash trees.* The public considers a forest lake to be by far the best alternative, followed by a overgrowing bog, which is preferred to a bog planted with ash.

   Mammals and birds are especially popular when encountered in the forest, whereas "Mosquitoes" are - not unexpectedly - unpopular. "A roe-deer" attained the second highest ranking of all of the 100 verbal stimuli used - surpassed only by "Tranquillity". Similarly, a black-and-white photograph, showing a road through a coniferous forest, in which a *roe-deer* can be seen - although not very clearly - on the right-hand side of the picture, received the highest ranking of all 52 black-and-white photographs; whereas precisely the same photograph - but *without the roe-deer* - only ranked as 15th in the public's mean assessment.

2. *Choice of tree species is, of course, one of the most important decisions in forestry. The public's assessment of this question has therefore been studied relatively thoroughly, on the basis of black-and-white photographs (the Experimental Method) and colour slides (the STA-Method).*

   According to the *mean opinion,* the public prefers DECIDUOUS FOREST to CONIFEROUS FOREST, summer and winter alike. However, the difference is less apparent in the winter and people living, for instance, in West Jutland, have no particular preference for DECIDUOUS FOREST over CONIFEROUS FOREST in the winter.

   The public's preferences for DECIDUOUS/CONIFEROUS FORESTS can also be influenced by promotion (propaganda), even though the forms of promotion tested did not cause any direct alteration in the direction of this preference.

Similarly, according to the *mean opinion,* and on the basis of colour slides, we have ascertained that the public prefers BEECH FOREST to OTHER DECIDUOUS FOREST (which in this case applies to all trees except beech), summer and winter alike.

Moreover, *beech* and *Norway spruce* have been directly compared using 5 pairs of black-and-white photographs, where the two tree species have been compared at different ages, also for both summer and winter. We can say that, according to its mean opinion, the public prefers beech to Norway spruce.

3. *Regeneration, formation and tending of stands:* by and large, this review of the results follows operations, from the planting of trees, until they lie as logs beside the forest road.

   - *Planting distance:* in Norway spruce (8 years after planting), a large planting distance (2.25 x 2.25 m) is preferred to a small (1.25 x 1.25 m) - due to the culture has a brighter, more open, appearance?

   - *Weeding of cultures* with *chemicals* is considered to be less acceptable than with a *scythe.*

   - *Fencing of cultures* is a relatively acceptable measure, once people understand or have been informed of the purpose, i.e. to protect certain young trees against deers.

   – *Fertilisation* is considered to be a significantly more acceptable measure than *chemical weeding.*

   – *Level of mechanisation:* the public's general assessment is unambiguous; the less mechanisation in the forest, the better. For instance, a horse is preferred to a tractor for logging timber.

   - *Method of thinning:* the public prefers *selective thinning* to thinning by *rows.*

   – *Degree of thinning:* the public prefers vigorous thinning.

   – *Logs and branches on the forest floor* lower the public's ranking (cf. Fig. 2). This result does notsupport the myth which asserts that "the public prefers to see forestry at work". This myth also conflicts with the public's general attitudes to mechanisation in the forest and to several operations associated with the regeneration, formation and tending of stands. We must assert that the public prefers *certain results* achieved by forestry at work.

   – *Dead trees:* according to the mean assessment of the public, a beech forest without a *dead tree* is preferred. Are dead trees perhaps too reminiscent of death, decay and destruction and/or chaos? This result agrees with earlier Danish surveys, as well asseveral foreign surveys, and indicates that the population as a whole has less understanding of the biological significance of dead trees than it has aesthetic/emotional aversion to them.

- *Logs and branches piled beside a forest road* have neither a positive nor negative influence on the public's mean assessment.

4. *Facilities for forest recreation:* one general methodological difficulty when assessing the public's preferences for facilities for forest recreation is that the assessment of such facilities *could* have been based more on aesthetic criteria than functional criteria. However, the weights attached by respondents to the different assessment criteria have not been studied, as the methods needed for such surveys are complicated, resource-demanding and uncertain. If this hypothesis is correct, it leads to a systematically lower assessment of photographs that show facilities for forest recreation in comparison with photographs from which such facilities are absent. This circumstance should be borne in mind when assessing the results below.

   – *General:* according to the *mean opinion* the public prefers forests *without* FACILITIES for forest recreation, summer and winter alike (the STA-Method).

   – *Parking areas:* not unexpectedly, the public prefers *small* parking areas in the forest; the smaller the better.

   – *Paths:* we can similarly assert that the less specialised and alien to the forest a path is, the more it was preferred by the public. The order of ranking, exercise track - bridle path - cycle path, conforms relatively well to the public's mean assessment of encountering the three types of forest visitor, jogger - horseman - cyclist. And one direct finding is that the public prefers a forest *without* an exercise track that has an obstacle.

   – *Other structures for visitors* have been studied using 14 verbal stimuli. The general impression given by the results agrees with the above conclusions: the less alien a structure is in the forest, the more it is preferred by the public as a whole. Thus, we find it remarkable that, for instance, "A fireplace with fire-wood", "A toilet" and "A playground with see-saws and swings" only ranked as 62nd to 66th out of the 100 verbal stimuli. On the other hand, "A wooden bridge across a cleft/ravine", "A bench" and "A shack (shelter) where you may seek shelter" received relatively high rankings.

   – *Nature interpretation* is a subject that has been studied less intensively than is considered desirable today. More generally - and not unexpectedly - it can be asserted that information on *why* a given measure has been implemented can make that measure more acceptable.

5. Hunting and management of wildlife: *as mentioned in the foregoing, sighting game in the forest received an extremely high ranking. On the other hand, meeting a hunter in the forest is not popular. According to the public's mean assessment, only motorists and moped riders are less popular forest visitors than hunters.*

3.3 Influences related to recreational use, which denotes the influence of other forest visitors on the quality of a visit to the forest, including the extent of any annoying/harmful behaviour and the rules imposed for limiting such behaviour. The following results have been obtained on the public's assessment of these influences:

1. *Numbers of forest visitors:* not unexpectedly, it can be asserted that the fewer forest visitors encountered on a walk in the forest, the higher the perceived overall quality of the visit.

   28 verbal stimuli were used to study seven types of forest visitor: families in the forest, horsemen, joggers, cyclists, hunters, motorists and moped riders; each type in the following numbers: 1, 2, 5 and 10. For all types of visitor, the general public's mean assessment dropped as the number increased. In particular and as far as most types of visitor are concerned, the increase from 2 to 5 resulted in a marked drop in the public's mean assessment, whereas an increase from 1 to 2 or 5 to 10 had less influence.

2. *Types of forest visitor:* the types of forest visitor studied can be split into three groups, according to the public's mean assessment of whom it prefers to meet in the forest: (1) the group that ranked highest, families in the forest, horsemen and joggers, (2) an intermediate group consisting of cyclists and hunters, and (3) the group that ranked lowest, consisting of motorists and moped riders.

   It is hardly surprising that major differences can be discerned in the preferences of different groups of the public. There is generally great approval of the type of forest visitor to which a given group of the public feels most "related", and considerably less approval of all the others.

   According to the public's mean assessment, "A motorist" and "A moped rider" ranked lower than the other types of forest visitor studied - regardless of their number (from 1 to 10) and including "10 hunters". This result agrees with the general conclusion, i.e. that the public desires as little mechanisation as possible in the forest, and that "Tranquillity" received the highest ranking of all of the verbal stimuli used, whereas "10 moped riders" was the verbal stimulus that ranked lowest.
3. Annoying/harmful behaviour, *by which should be understood the forms of behaviour that are regulated/prohibited in the various rules governing public access and visits to forests. The following results have been obtained on the public's assessment of this subject:*

   – *in general,* it can be said that the public's overall ranking of annoying/harmful behaviour is very low. This *could* be interpreted as an expression of a general acceptance by the population of the rules governing public access and visits to forests; but it *could* also be due to knowledge of these rules in combination with a desire to adapt the response to the receiver (an idealised/strategic response);

– *the use of different types of transport in the forest:* in conformity with the rules on public access to the forest, the public as a whole gave a very low ranking to encounters with motor vehicles (cars and mopeds); cycling is ranked more highly, although not as highly as riding a horse or walking;

– walking *in the forest with a dog off the leash* generally received a low ranking; neither did "An area where dogs may run free" receive a particularly high ranking from the public as a whole. There is however far from general agreement among the public over walking with a dog off the leash in the forest: the standard deviation of all the stimuli relating to this subject was very large;

- *major outdoor events* are not generally appreciated by the public. The general impression given by the results agrees with earlier conclusions, i.e. the less annoying and alien an event is to the forest, the better it can be accepted by the general public;

- *actual damage to the forest and its trees* has only been studied to a very limited extent. Generally, the public - and young women especially - considered the carving of names on trees to be relatively acceptable behaviour, whereas it was considered less acceptable to break a branch off a tree.

Postscript

During 1993-1994 a new data collection using the Experimental Method has been conducted at the Danish Forest and Landscape Research Institute. All photographs and almost all verbal stimuli from the 1977-1978 survey are assessed again by a random sample consisting of 2916 adult Danish citizens. That survey, called "Outdoor Recreation '95" gives excellent opportunities to study trends in the forest preferences of the population. The results will be published during 1997 in the "Research Series" from the Danish Forest and Landscape Research Institute.

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Verbalization of experiences connected with forest visual variation - empirical studies and theorethical frame

Formulation des expériences en rapport avec les variations visuelles de la forêt : études empiriques et cadre théorique

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Abstract: *Forest recreation is a very usual and popular leisure activity in the Nordic countries and people are willing to spend quite a lot of resources to maintain and develop aesthetical qualities of forests. Forest aesthetics must be linked with other multifunctional aspects of forest, and Forest Visual opportunity Spectra is a good tool to accomplish this. Change and variation are important explanations of why a forest is pleasant to stay in. Five specific visual forest types are identified. Differences in forest preferences between the Nordic countries are discussed. To describe aspects of forest aesthetics from expert knowledge and from the role of an expert designer seem strange in a Nordic context. The reasons for developing a Semantic Model for Forest Experience are highlightened. In these studies, comparisons will be carried out between assessments made by groups of lay population from different parts of Sweden and Denmark, and comparisons will also be made between assessments of forest interiors and views of forest landscapes.*

Résumé : La fréquentation des forêts est une activité de loisir très courante et populaire dans les pays nordiques et les gens sont prêts à dépenser beaucoup pour conserver et développer les qualités esthétiques de ce lieu. L'esthétique de la forêt doit être reliée à d'autres aspects plurifonctionnels, et le "Spectre des possibilités visuelles forestières" est un bon outil pour accomplir cela. Les changements et les variations sont des explications prépondérantes quant au plaisir de rester dans une forêt. Cinq types visuels spécifiques de forêt sont identifiés. Les différences de préférence à l'égard des forêts entre les pays nordiques sont analysées. Décrire les aspects esthétiques de la forêt à partir des connaissances d'un expert et à partir du rôle d'un expert-designer semble étrange dans un contexte nordique. Les raisons de développer un modèle sémantique relatif à la pratique de la forêt sont soulignées. Dans ces études, des comparaisons seront effectuées entre les évaluations faites par des groupes sociaux de différentes parties de Suède et du Danemark. Les comparaisons seront aussi faites entre les évaluations intérieures de la forêt et les vues de paysages forestiers.

To take a stroll in the forest is a very usual and important leisure activity in the Nordic countries, where people more often take a walk into the forest than go to the library, theatre or to a sports arena (Jenssen 1995). Development of nature areas for open air activities is also what people in Sweden most of all want local authorities to spend the resources of the leisure sector on (Blomdahl, Elofsson, 1987). Accordingly, Swedes would rather like a well managed recreational forest than a football arena, for example.

Studies also show, that the experiental values of forests exceed the values of traditional timber production in areas for nature tourism and recreational activities (Johansson et al 1995). The composition of forests, and the experiences they bring, are of such an importance that people are willing to spend quite a lot of resources in order to maintain and develop the aesthetical and experiental values of forests. In Sweden, there are around 200 000 hectares of urban forests (Skogsstyrelsen 1991), while in Finland the urban forest area is twice as large, i. e. about 400 000 hectares (Lövström 1995). The larger the areas suitable for recreation activities are, the less are the risks for disturbances. Since forest experience is of such great importance to so many, forest experience is also of central cultural importance, not least in the Nordic countries. Forest as a source of experience may give a broad understanding of the meaning and importance of biological manifold - and sustainable development - for the entire living environment.

Forest experience and forest aesthetics must be linked to other multifunctional aspects of forests. A Danish study shows, that possibilities to see wild animals increases the experiental value of forests dramatically (Koch & Jenssen 1988). Several studies point out, that people in general want the forest to be managed (Hultman 1983, Savolainen & Kellomäki 1981). At the same time, people have very clear opinions about different kinds of forestry methods (Kardell et al 1993, Koch & Jenssen 1988).

By identifying 'Forest Visual Opportunity Spectra', it is possible to create multiple use alternatives of forest areas, where visual aspects may be taken into account in a similar way as flora and fauna, and timber production, for example. Each specific visual forest type then gives special opportunities and limits for forestry as well as for flora and fauna aspects. Thus, there are preconditions for creating patterns of forest stand combinations for aspects involved in multifunctional forest management.

Which forests are then best and least suited for recreation activities ? Change and variation are often important explanations of why a forest is pleasant to stay in. Changes between different kinds of forest stands are important. In our field studies of these aspects, two hiking trails are laid out in a forest, one passing through many visual forest stands and one passing through few visual forest stands. The visual forest stands have been identified in the field by a landscape architect (C. Axelsson Lindgren). Experimental subjects form two groups of the same size.

Assistants guide the groups along the trails, one group walking trail A before trail B, the other group walking them in the reverse order. At the end of each trail, the assistants ask the respondents to fill in a questionnaire. This questionnaire mainly contains seven-step rating scales concerning the variation, pleasantness and originality of the trail, and assessments of whether the trails are suitable for activities such as strolling alone, picnicking and jogging. Findings are, that the amount of variation determines how many different kinds of activities people whish to practice in forest areas. It also seems to be easier to make correct judgements of the length of a trail and of the time spent to walk it, if the trail goes through many visual forest stands (Axelsson Lindgren 1990).

To get more knowledge about forest visual variation, I have studied what people perceive as differences and similarities between forest stands (Axelsson Lindgren 1990). Two identical sets of 30 dia slides of forests interiors were used. All photos were thus presented pairwise together with all the other 29 slides: in all 435 pairs of slides were shown at each substudy. On a 10 cm long rating scale, the subjects - around 30 persons in each substudy - marked how similar or different the two slides in each pair of slides were. Each pair of slides were presented for 10 seconds, and each substudy took about 2 hours. The mean values of the ratings for each pair of slides form the basis for factor analysis of the results (see also Sorte 1982).

Five visual forest types with specific character are found. People have, in open ended questions, among other things described what they would like to do in these forest types:

* coniferous forest with very visible stems	- nice environments for strolling, picking berries and mushrooms and for studying nature
* dense young deciduous forest	- suitable for studying birds and insects; an interesting part of a larger forest
* mixed coniferous forest	- good areas for picking berries and mushrooms and for looking at plants and animals
* deciduous pillared halls	- picnicforest, easy to walk in and suitable forl ooking at spring flowers
* dense coniferous forest	nothing to do, the forest acts as a wall

In studies of what kind of forest stands people like the most and the least in Finland, Norway, and Sweden, broadleaved deciduous forest is not taken into account. Danish studies, on the other hand, contains quite a lot of pictures of the popular broadleaved deciduous forest, but there are no pictures of indigenous mixed coniferous forest, which hardly exists in Denmark (see discussion in Axelsson Lindgren 1995). Indigenous mixed coniferous forest, with mixes in species and ages as well as in density, is the most popular forest stand in Finland, Norway and Sweden.

A pilot trail study (see the trail study method described above) in both Danish beech forests and Swedish mixed coniferous forests with groups of Danish and Swedish subjects indicates, that the Danes also highly appreciate mixed coniferous forest (Axelsson Lindgren 1988). Since broadleaved deciduous forests are rather common in densely populated areas, they are probably of great importance for recreations activities and experiences in all the Nordic countries.

The rule that 'too much and too little never is right' also goes for forest visual variation. The practice that the Danes call 'stamp forestry', where many small and different forest stands with sharp edges are gathered in a small area, easily gives a motley and confusing impression. In certain environments, the vastness and uniformity of a heath of Pinus silvestris may be exactly the right quality to promote. One main rule is often to develop a forest environment, which gradually brings an agreeable amount of different experiences along the walk. The more variated a forest is, the more likely one is to find peaceful and undisturbed environments also in frequently visited areas.

In English speaking culture, there is a long tradition among experts to look at the landscape as a view or as a picture. These traditions have been documented in landscape painting, poetry and literature (Craik 1983, Andrews 1989). The approach to describe aspects of forest aesthetics from expert knowledge and from the role of an expert designer seem strange in a Nordic context. Furthermore, criticism has arisen against american expert based visual assessment systems for not being in accordance with lay opinions of forest environment (Arthur et al 1977, Grden 1979, Kaplan 1979, Kopka & Ross 1984). Several studies in the Nordic countries show differences in judgements between experts and groups of lay population concerning forest experience (Hultman 1983, Kardell 1990, Savolainen & Kellomäki 1981).

My studies using open ended questions and tasks indicate, that it's not so easy to describe forest experience in words. Answers to tasks as 'describe to someone what you experience in this forest environment' most often contains descriptions of forest species and of specific recreational activities. Important issues, dealing with personal involvement and feelings, may not be so easy to express to complete strangers. Therefore, I carry out research concerning the development of a Semantic Model for Forest Experience, based on assessments made by groups of lay populations. These assessments will also be compared with the opinions and experiences of different expert groups.

A scientific method described in detail by Küller (1972, pp. 16-35, 61-66) was used for the development of the Semantic Model for Built Environment. This model has proved itself to be stable in different cultures and for urban townscape as well as for room interiors (Kwok 1979, Küller 1979). The experiental dimensions of the Model alltogether catch the atmosphere or the mood in an environment; i. e. the feelings evoked by the character of the environment. These feelings are important but seldom strong and easily identified.

Rather, they are delicate results of the influence of the everyday environment on the individual. The importance of the experiental dimensions for wellbeing has been enlightenend by Küller (1980). When attention is turned towards other aspects of the surroundings, such as objects and forests, the spectra of experiental dimensions change in different ways.

In the development of the Semantic Model for Forest Experience, the scientific method described by Küller (1972) is used. For each of the around 80 adjectives used in a substudy, 15 dia slides of either forest landscapes or forest interiors are presented to subject groups of around 40 persons. The subjects fill in a seven step scale for each slide, i. e. 15 scales for each adjective presented. The mean values of the subjects assessments are used for factor analysis and other multivatiate analyses of the results. Each slide is presented for 10 seconds and each substudy takes a little more than 2 hours. Different presentation orders are used both for adjectives and slides.

A Semantic Model for Forest Experience makes it possible to compare and combine forest environments with different visual characters in a nuanced way. The model also gives possibilities to develop further knowledge on forest visual variation, based on the importance of experiental dimensions for the wellbeing of humans. In an ongoing cross-cultural study, slides of Nordic forest environments and all adjectives in the Swedish language related to forest experience are used as a starting point for studies of assessments of forest experiental qualities. Comparisons are made between assessments of forest interiors and views of forest landscapes.

The recently conducted substudies contain assessments by city a population compared with assessments by countryside populations in Sweden from areas with coniferous forest, and from areas where broadleaved deciduous forest is common. In the cross-cultural study, similar studies will be carried out in Denmark, with Danish translations of the adjectives used. These assessments will also be compared with expert assessments. The results so far are very preliminary, as only half of the cross-cultural study is carried out. Several similarities seem to be found with earlier studies. There also seems to be specific experiental dimensions related to forest experience. Further, the results indicate some differences between urban and rural populations.

As an archetype, forest may symbolize the structure of the subconscious part of human thinking, where for example feelings take form. Perhaps, such interconnections between the individual and the surrounding may give a sence of reliance, that is necessary for letting the personality grow and take form anew. This kind of recreation may be seen as a process of understanding, which in suitable environments lead to personal development and to the ability to take a creative attitude towards life (Axelsson Lindgren 1990). We will continue to study the relations between forest management practices and the quality of forest experiences among those who visit forests.

A **personality-developing recreational process** can be summarized like this (Axelsson Lindgren 1990):

In an environment where the dependence of the human being on the surroundings is made clear in a pleasant way, so that it is possible to feel graciously affected by being alive, the individual plays in interplay with the surroundings.

The playing takes part in time that is at the individual's own disposal and preferably together with people with whom one has personal ties. When playing, an interaction between experiencing, acting and pesonalizing leads to an increased understanding of one's situation in life and of the surrounding environment. The individual can thereby take a creative attitude towards life, that brings about a meaningful sense of competence and self-determination.

In this context, play may be perceived in the following way:

PLAY is a process of understanding, where the actions express your own motives as an individual. These actions give opportunity to personal understanding of your life situation and of your surrounding. The actions have a character of developing concepts or of testing the relevance of concepts.

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Public perception of land use transformations, conceived and measured in terms of appropriation

Perception publique des transformations dans l'utilisation de l'espace, analysée et mesurée en terme d'appropriation

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Abstract: *Public perceptions of land use transformations are preferably to be conceived and measured in terms of appropriation. At least four catégories of appropriation appear to be relevant. Further, perceptual impacts of land use transformations, as defined in terms of these appropriative catégories, should be assessed in relation to the central concept of regional identity. Identity appropriation of landscapes may be measured with a special scale, the SUjective Motor Appropriation Scale (SUMAS). Studies with this scale performed in différent regions, using both black-and-white sketches and simple labels of landscape elements, demonstrate differential effects of scale transformations, and of impending tourism pressure on landscape identity propriation.*

Résumé : Les perceptions publiques des transformations de l'espace doivent de préférence être analysées et mesurées en terme d'appropriation. Au moins quatre catégories d'appropriation semblent pertinentes. De plus, l'impact perceptif des transformations de l'espace, comme défini à travers ces quatres catégories, peut-être évalué en relation avec le concept central d'identité régionale. L'appropriation identitaire du paysage peut-être mesurée sur une échelle appropriée : l'échelle du "moteur subjectif d'appropriation" (SUMAS). Des recherches, réalisées grâce à cette méthode dans plusieurs régions en utilisant des esquisses noir et blanc et des désignations simples d'éléments du paysage, montrent les effets de différents niveaux de transformation et de différents niveaux de pression touristique sur l'appropriation identitaire du paysage.

Introduction

The perception of a region, and of ongoing transformations of that region are part of the transactional relationship a person has with that region. This transaction is, in a dynamic sense, in its most simple form a matter of psychological appropriation and misappropriation of that region, and its elements. According to Chombart de Lauwe (1976) four catégories of appropriation may be differentiated, namely (1) the ability to 'modify' and 'use', (2) the ability to 'act more or less freely' and exert 'dominance' in cases of 'conflict', (3) 'aesthetics', and (4) the ability to expérience the environment as 'symbol-bearer, according to a hierarchy of values'.

Appropriation of a region by a community involves all these catégories. People, inhabitants and those living at a distance, modify and use the region in an economic way by cultivating the land, and changing the land use forms more or less regularly. Free action and dominance is involved when inhabitants and visiter such as travellers for commercial reasons, or tourists, or just passers-by, perform activities for which they are attributed legal rights for a certain amount of time and on a certain location. The 'use' these groups make of the region is of course not the kind of use which implies a depletion of resources to a large extent, such as is often the case when a landscape is modified by producers. During their activities, both inhabitants and visitors appropriate the environment also in an aesthetic way. They may come to love that particular region, or detest it just because of its landscape, or the persons, or elements present in it. This strong emotional commitment may also, finally, be conditioned by the symbols this particular region represents in a wider cultural contexte according to some hierarchy of values. Such values may be commercial, ecological, national, religions, or based on whatever other value system that happens to predominate in the perception a person has of that region.

1. Appropriation measurement with an appropriate scale: SUMAS

Assessment of this rather diverse complex of appropriative catégories needs an appropriate scale. Such a scale is the Subjective Motor Appropriation Scale (SUMAS), which was used for the first time by Boerwinkel et al. (1969) to assess the appropriative status, or'relevance', of an expérimental task in a laboratory in terms of psychological 'distance'or'closeness'. The subject, indicated by the word'Me'on the left side of a sheet of paper (figure 1), was asked to score the closeness or distance feeling toward the task, or any other conceivable object of appropriation, with an arrow, starting from 'Me' toward one of nine circles, located at equal intervals, to the right.

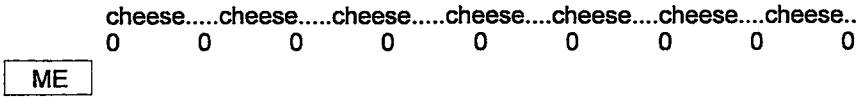

Figure 1: The subjective Motor Appropriation Scale (SUMAS). After Boerwinkel et al. (1969)

As far as the construct validity of SUMAS is concemed, Boerwinkel (1996a 1996b) has described the affinity with Kurt Lewin's (1951) 'llfe space' concept', Edward Hall's (1966) personal space differentiations, Karen Homey's (1945) conceptualizations of 'moving toward', 'against', and 'away from' a relational object, and Brehm's (1972) concept of 'psychological reactance'.

Since the first use in the Boerwinkel et al. (1969) study, SUMAS was applied in studies with many différent objects. Objects to be evaluated could be social elements of the environment, i.e. persons and groups, such as other participants in a group training situation, people at the workplace, neighbours, people living in the residential city, and people to be encountered in recreational settings. On the other hand objects could be physical elements of the environment, such as urban environments, rural landscapes, forests, and individuel trees. Further, opinions about social and physical elements, and any other attitude object, were involved in SUMAS évaluations, such as opinions about the environment, and values. Some of the results of these studies have been surveyed by Boerwinkel (1996a 1996b).

As SUMAS evidently measures emotional aspects of appropriative relationships with persons and objects, it is to be expected that SUMAS will be correlated with affective descriptive labels for persons and environmental situations, more than with cognitive descriptive labels. In the small survey by Boerwinkel (1996a 1996b) of studies containing relevant data this expectation was indeed confirmed.

Further, as emotional transactions with people and environments may change very rapidly even in short periods, it is to be expected that SUMAS will accordingly vary strongly in such situations. This rapid change was indeed corroborated in one study (De Swaaf 1971; see Boerwinkel 1996a 1996b) of a sensitivity group training situation.

As SUMAS is intended to measure at least the four différent appropriative catégories of Chombart de Lauwe (1976), these catégories have to be specificly demonstrated in SUMAS studies. To this end Boerwinkel (1996b) has focused on the aesthetic category, and the differentiation from, and connection with, other catégories, particularly, the freedom to act and to be dominant. Elsewhere (Boerwinkel 1996a) has focused more exclusively on the freedom to act and to be dominant in conflicts between recreation groups, and on the appropriation and misappropriation of certain management measures to avoid these conflicts.

All these properties of SUMAS make this technique usable for the assessmenti of public perceptions of land use transformations. Not only the visual impact of such transformations of the landscape may be assessed with SUMAS as to its appropriative conséquences, but in connection with this visual impact also other actors in the social land use dynamic may be evaluated by interest groups as to the alleged légitimation of their contribution to major land use changes.

2. Identity appropriation and landscape transformations

The type of change a landscape may undergo due to changes of land use may affect the overall structure, or certain elements, or a combination of these. In the Fifties and Sixties large parts of the Dutch landscape were restructured by enlarging the scale, straightening brooks, and infrastructure, and introducing particular tree species, such as poplar. As in many other countries the general motive was the enlargement and improvement of the efficiency of agricultural and silva production. In the Seventies, the rapid decline of nature and the explosive émergence of pollution problems brought about an elite critique of instrumental rationality, and subsequently a general shift in social values from sheer production to ecological and visual impacts of landscape transformation. The onset of an economic decline of the Dutch agrarian position, relative to other European countries, further sustained, in the Eighties and Nineties, this general motive of préservation of what was left of nature and small-scaled cultivated landscape, and a development of new. nature on former agrarian locations.This dynamic will definitely lead to a renewed small scale in many parts of the Dutch countryside.

One relatively new central concept, introduced in a govemmental note (Ministerie van Landbouw, Natuurbeheer en Visserij 1992) as a leading principle for land use programs, and for critically guiding both the visual préservation and reconstruction of the landscape was the concept of landscape 'identity'. In a couple of public perception studies performed with SUMAS the connection of this identity concept with major landscape transformations in the past and in the future can be demonstrated.

In the beginning of the Eighties a reallotment program was set up for a landscape in the province of Gelderland in the eastem part of the Netherlands. While this landscape had been small-scaled until the beginning of this century, many of the hedgerows and other smaller tree plantings had disappeared, either due to a lack of a definite agrarian function, or to an obstructive impact on efficient agricultural management. Sometimes some desolate ghosts of trees were left over, presenting the picture of a fragmented landscape (see, for example, figure 5-SOl). Also, brooks had been straightened, measuring up to the post-war standard for water management (see, for example, figure 3-S45).

The question now was how people living in the area would judge their landscape environment, and a diverse set of possible measures to redesign it. The study that was performed to answer this question was not an official part of the reallotment program, but was yet supported by a committee of interest groups. A représentative group of respondents living in the village of Steenderen, or in its surtoundings, was approached for an interview in which, among other questions, black-and white sketches were presented of several locations in their landscape, along with certain transformations. The évaluation of in total 50 sketches with the SUMAS appropriation scale was factor analyzed with orthogonal varimax rotation, resulting in 10 principal components (figure 2). When the SUMAS scores on the sketches contributing most to a comportent were summated and averaged, most of the components appeared to cluster in the acceptable zone of 3 to around 4. Only two components fell in the zone of dubious acceptance or even rejection. The rejected comportent contained large-scale landscape images (6.3) without any indication of concern for greenery. The dubious comportent (4.6) contained particularly images of locations that were représentative of the at the time modem look of agrarian effectiveness (figure 3). From the dispersion of the principal components of landscape images over the SUMAS scale it could be concluded that the small-scaled situations, either representing the present, or a possible redesign, were favoured over the large-scaled, open landscape images. This suggests opportunities for afforestation, or planting trees in hedgerows and along lanes.

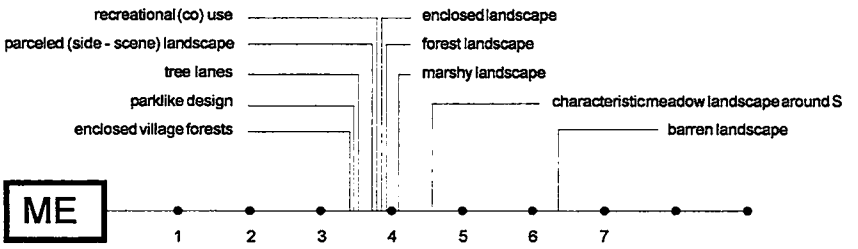

Figure 2: Average SUMAS appropriation scores (N=96) for principal components of 50 black-and-white sketches of present and possible landscape images around Steenderen (Neth). After Helsloot and De Milliano (1983)

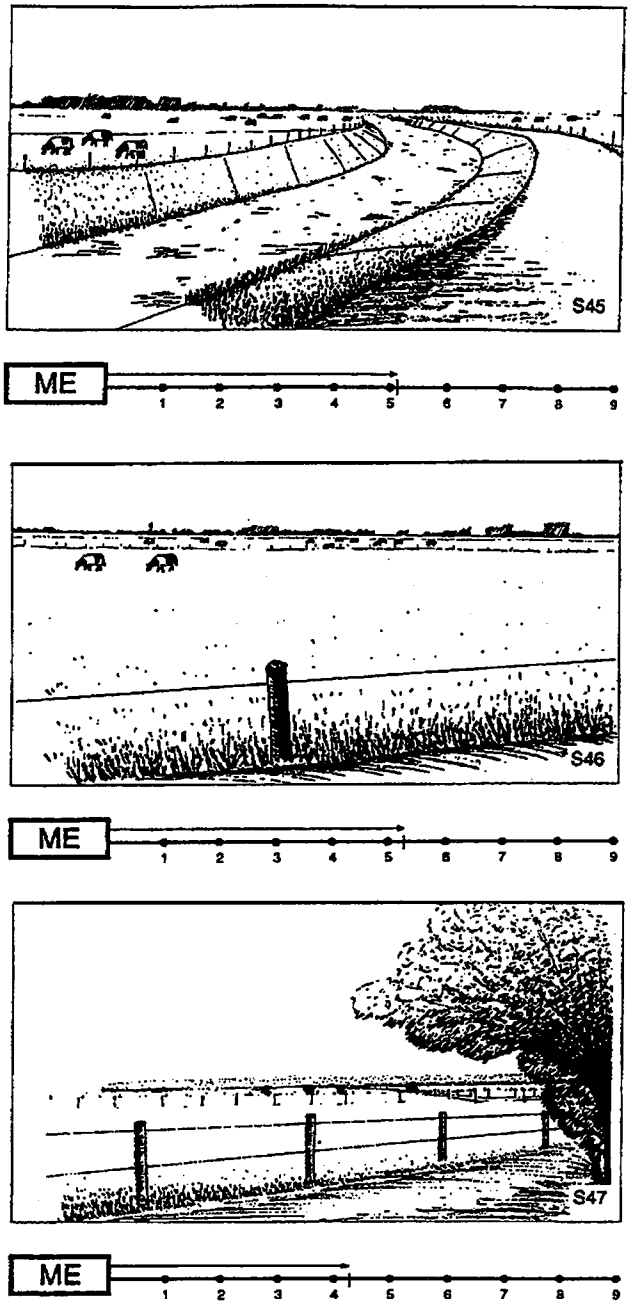

Figure 3: Example of landscape images with average SUMAS appropriation scores contributing most strongly to the "characteristic meadow landscape around S' principal component in figure 2. Adapted from Helsoot and De Milliano (1983)

In another study with SUMAS, however, with only a very small, and not représentative, number of people (N=14), living in a region in the province of Friesland in the North of the Netherlands, a différent conclusion had to be drawn (Van de Beek 1985).

In this study sketches were presented of the landscape in axonometric form, giving the respondent a view into the landscape from above -as with a map, rather than at eye-level. Starting with the present situation, the respondent was confronted with an increase of tree plantings, first in the form of rows along the main roads between villages, then in another alternative supplemented with similar rows along secondary roads, leading somewhat into the hart of the vast open space, that characterises the landscape as a primary identity feature of large parts of this province. In the third alternative trees were only planted just glued to villages or farms, leaving the existing open space largely intact. Two other alternatives were connected with a reallotment part, next to a highway, strengthening the linear form of the highway, and the geometric form of the new

parcelling structure. Each alternative treatment of the total region was presented first for the west and east part of the region separately, and subsequently for the two parts together.

In figure 4 the result of average SUMAS scores for the six alternatives shows that the present situation is valued best (W 1, E 1, and W 1 -E 1). Further, the alternatives of trees along the main roads, either supplemented with trees along secondary roads or not, and trees glued to villages and farms were also rather well appropriated. The other two alternatives, containing trees along the highway and suppléments at the reallotment area were less favourably appropriated, although not leading to an unacceptable level.

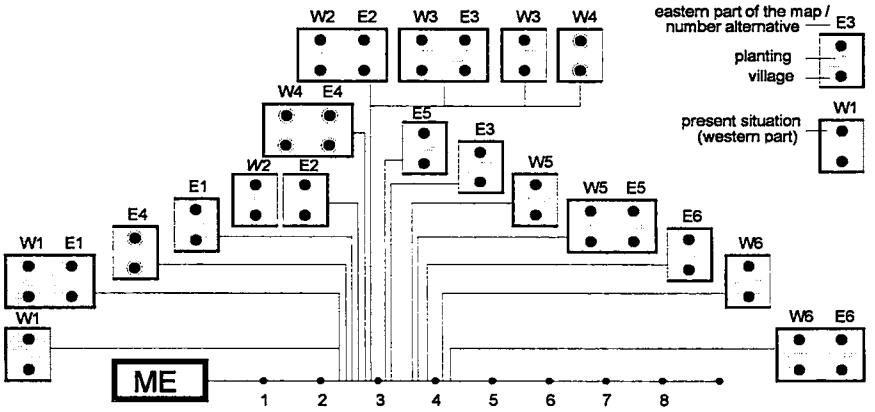

Figure 4: Average SUMAS appropriation scores (N=14) for the main vegetation masses in the existing situation (W1/E1) of the region of Baarderadeel (Neth), and six alternatives (W2-6/E2-6), presented as axonometric sketches. Adapted from Van de Beek (1985).

One has, of course, to consider the very small number of respondents in this study. However, compared to the situation in the region around Steenderen in Gelderland, where the restoration of the historic small scale was definitely favoured over the existing larger landscape scale, the existing large scale in the Frisian region tumed out to be rather well appropriated, and scale réduction not particularly welcomed.

The conclusion from these two studies is that the appropriation construct, as measured with SUMAS, provides a useful tool for assessment of public landscape identity perceptions. Differentiation between existing and transformed images, and between regions opposing one another in historic scale is quite possible with this construct and technique.

As for the specific appropriative category that is at stake, particularly aesthetics seems to be involved. However, the fact that SUMAS also channels impacts of certain elements in the landscape image on other appropriative catégories, such as modification and use, or the symbolic aspect is demonstrated in différences between focus groups, such as people with and without agrarian affinities. In figure 5, representing a situation around Steenderen as it was, and four sketches with alternatives for redesign of hedgerows between parcels, the only significant différence between these two groups emerged for the most natural, or ecological alternative.

Apparently this alternative, that was less well appropriated by the agrariens, although again not to an unacceptable extent, either would obstruct modification and use of the landscape in their daily routine of maintenance, or would not be in accordance with their more rationalized symbolic value system.

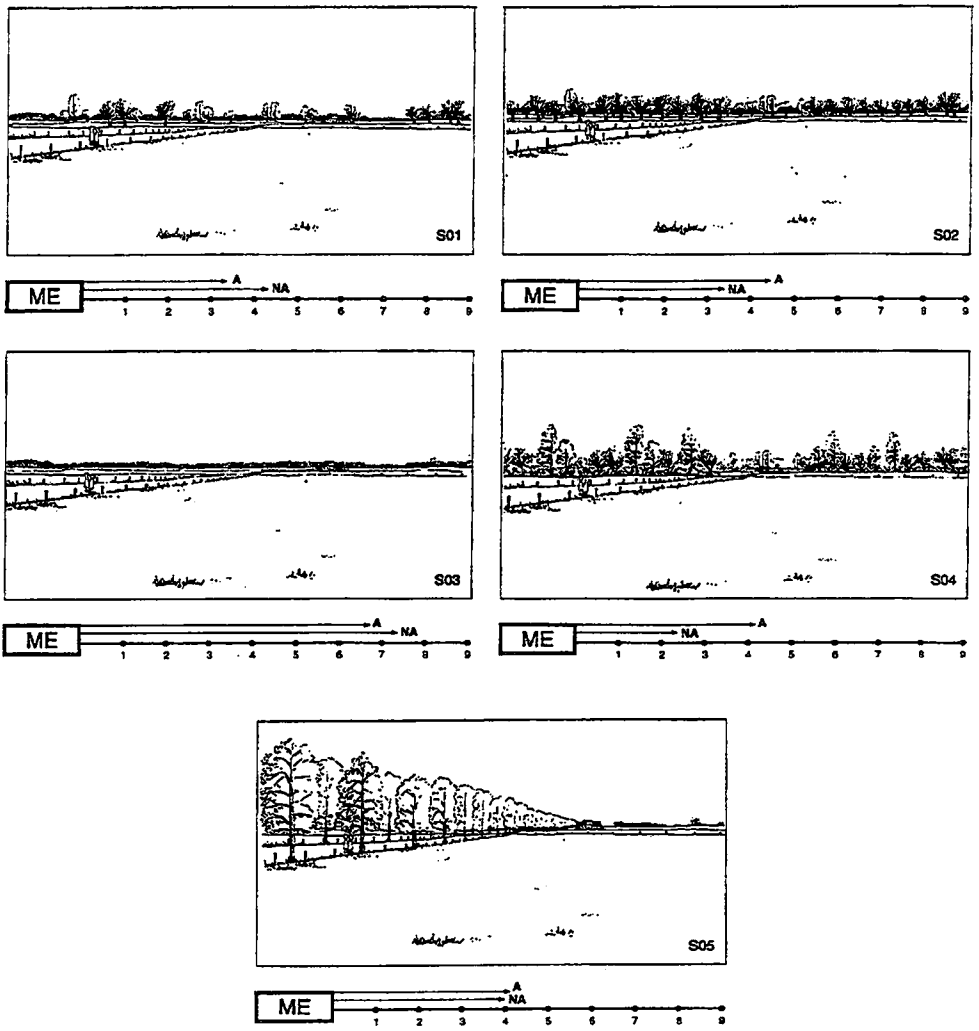

Figure 5: Example of one landscape situation around Steenderen (Neth.) représented in black and white sketches as existing image (SO1), and four alternative reconstructions (SO2-SO5 (A/NA = agrarian/non-agrarian affiliated occupation; only the difference for SO4 is significant: p(two-sided)<.05, N=96). After Helsloot and De Milliano (1983)

That landscape appropriation, whatever appropriative category may be involved, may exceed other, more social, aspects of regional identity in importance was demonstrated in another study on a Frisian island in the North of the Netherlands.

Landscape and socially based regional identity.

Focusing on impacts of tourism on host community identity Eijssen et al. (1994) asked a representative group of 270 inhabitants of the island of Terschelling to score with SUMAS a large group of elements that could be judged as more or less characteristic of the island. Figure 6 shows the SUMAS mean scores and the principal comportent structure (the rankings of the components follow the order of eigenvalues). The interprétation of components given below differ sometimes from the interprétations given by Eijssen at al. in their original report. The interprétation given here is'supposed to be more in line with the previous arguments about identity, and appropriative catégories.

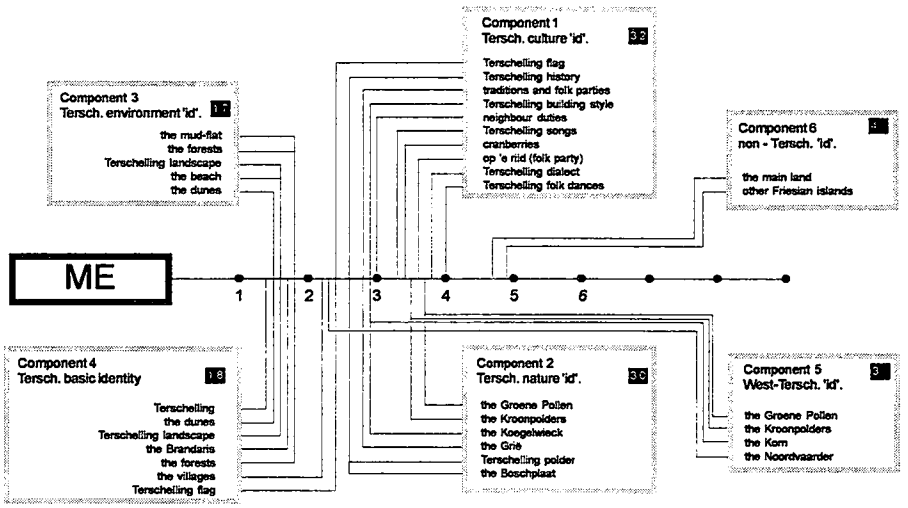

Figure 6: Pattern of average SUMAS appropriation scores for Terschelling identity components, and elements of these (N=260). Translated from Eijssen et al. (1994)

As it was to be expected that components with lowest average mean scores of its contributing elements reveal genuine and intimate identity components, comportent 4 is the one supposed to cover a basic Terschelling identity (and therefore the only comportent not labelled with quotes). First, because it bas, with comportent 3, the lowest average mean score. Second, because, unlike comportent 3, it contains the label Terschelling itself.

Component 3, containing exclusively landscape elements, is, however, a very important second one to focus on when impending transformation of the landscape is concemed. This is because tourism on this island, on which some eighty percent

of the inhabitants, either directly or indirectly, depend for their living, is to a large extent directed at these landscape elements. Negative impacts from tourism will also affect these elements even more than some of the items of the primary identity comportent 4.

Viewed from a social and cultural, and tourisme perspective comportent 1 is v:ery important as it contains social and cultural elements that are part of the historical identity, elements that are presented to the visitor as the so-called tourist product. It involves elements developed during the long history of Terschelling constituting the social fabric of the community.

Components 2 and 5 contain, further, natural areas that are mainly only identifiable by inhabitants.

Component 5 consists of areas located in the most densely populated westerly zone of the island.

Component 2 is focused on the middle and easterly zones of the island.

All components so far may suffer from high pressure from tourists, which is not the case with comportent 6, because it is concerned with non-Terschelling regions.

In this same study questions were asked about the évaluation of impacts of tourism in the past, and of measures to be considered as options for meeting increased tourist developments in the future. In relation to these questions, a next interesting psycho-dynamic question is what comportent of identity appropriation is most important as a moderating variable for these acceptance/rejection patterns. Because, as Smith (1989) indicated, préservation of identity under pressure of increased demands in many cases appears to be a serious problem, it is particularly critical if the Terschelling basic identity would be affected by acceptance-rejection patterns of new tourist developments.

Both the évaluation of developments in the past and possible further developments were assessed with the SUMAS scale. For the former only one principal comportent emerged, indicating one general acceptance-rejection appropriative dimension by which several past developments were evaluated. This dimension of developments in the past which on the average (4. 1) met more acceptance than rejection included such diverse elements as lodging, cycling, and boating facilities, and the disappearance of the Terschelling building style.

For future developments three components emerged (figure 7). A high tourism expansion scenario (comportent 2) was predominantly rejected (7.7; the rather welcomed proposal of small hotels and boarding houses, on which tourism on the island for a long time has been based traditionally contributed negatively to this comportent). A more moderate tourism expansion scenario (comportent 3) was judged as much less unacceptable (5.3), with season extension as a quite

acceptable (3.3) measure in this contexte A third scenario, implying the management of increased tourist pressure by reserving zones for différent tourist groups, such as nature enjoyment seekers and nature interpreters, and general fun seekers, was met by acceptance but not a very strong one (comportent 1; 4. 1).

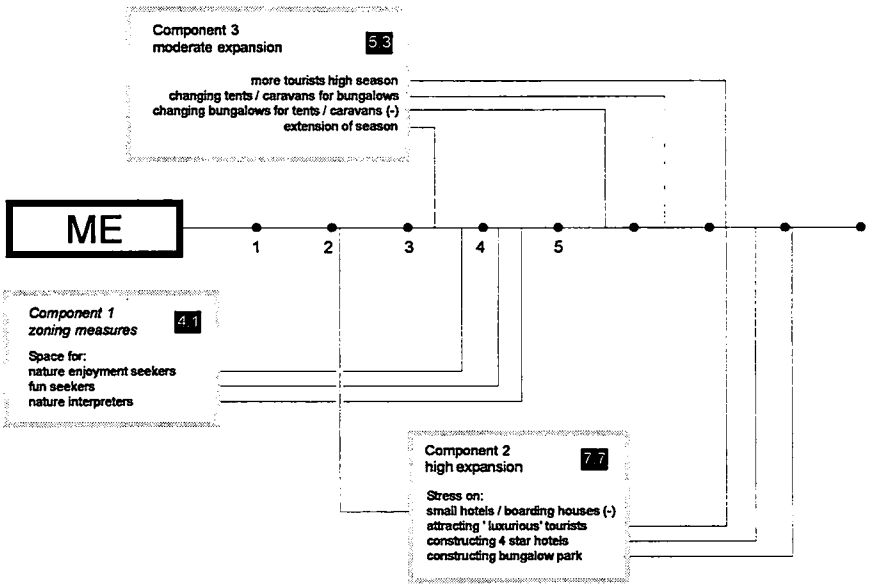

Figure 7: Pattern of average SUMAS appropriation scores for different components of possible tourism developments on Terschelling, and elements of these (N=260). Translated from Eijssen et al. (1994)

Looking for effects of tourist pressure perception on identity components it turned out that not the Terschelling basic identity, but Terschelling environment identity, is significantly and most strongly correlated with rejection of the scenario of high expansion tourism (table 1). Terschelling basic identity is significantly and positively correlated with acceptance of developments in the past, and also, but less strongly, with the scenario of zoning focus groups of tourists in the future.

	past developments	zoning for focus groups	high future expansion	moderate future expansion
T culture "identity"	.02 (.75)*	-.12 (.07)	-.12 (.09)	-.08 (.31)
T nature "identity"	-.10 (.14)	-.01 (.88)	-.12 (.08)	-.11 (.11)
T environment "identity"	-.04 (.58)	-.01 (.85)	-.22 (.001)	-.06 (.42)
T basic "identity"	.21 (.003)	.14 (.04)	-.10 (.17)	.10 (.15)

Table 1: Correlations (pearson) between SUMAS Terschelling (T) identity components and SUMAS acceptance-rejection of past tourism developments, and three types of future tourism developments (N=211)

*two-tailed significance p values

The conclusion must be that for Terschelling inhabitants neither the impact on some elements dominating the basic Terschelling identity comportent, nor the impact on the social and cultural comportent, or on the comportent containing particularly natural areas, is perceived as a risk. It is the transformative impact of tourism on the landscape in general that bothered this host community particularly. This potentially threatened general landscape contains in the dunes both open parts with heather and more forested parts. Parts that have been preserved for quite a lot of decades. As far as the appropriative category is concemed either the aesthetic one, or the free action and dominance (against tourist visitors) or symbolic one (for example préservation of the island status), or a combination of these, may be involved.

Conclusion

Identification with a region, such as the area around Steenderen in Gelderland, in Baarderadeel in Friesland, and the island of Terschelling, implies to a large extent appropriating the landscape in a form that has apparently strong historical roots. While around Steenderen the disappearance of the historic rather small scaled landscape was regretted, in Baarderadeel the closing of the flawlessly preserved historic open landscape was not wellcomed. On Terschelling the potentiel threat to identity that increase of mass tourism could bring about was associated particularly with the still preserved historic dune landscape, and not with social and cultural identity components. As far as afforestation is concemed there appears to be room for it particularly around Steenderen.

As far as the general appropriative catégories of Chombart De Lauwe (1976) are concerned, it looks as if particularly the 'freedom of action and domination' is involved in reactance against impending transformation by agriculture, or tourisme As for the interprétation of the results in terres of 'symbols according to a hierarchy of values', there is a possible hint of it in the fact that historic roots are indicated as the main standard for the judgement of transformation acceptablity. However, there is no direct proof in the presented studies that such characteristics as modemity or postmodemity as planning styles are involved. Particularly the local implication of the regional identity level of appropriation favours the freedom of action and domination interprétation. It contradicts, at the same time, a more general cultural style as an interprétative contexte What is particularly local can not be general at the same time. Elsewhere Boerwinkel et al. (1996) have demonstrated that the (symbolic) basic cultural attitude interprétation is in a measurable way responsable for changes in design views over decades. Perhaps an impending transformation of historicly well preserved landscape images by new developments of nature, such as are indeed already planned in the Netherlands, as opposed to historic aspects of landscape structure, may trigger the basic cultural attitude level of appropriations. This could be measured by combining in new studies with SUMAS appropriation réactions to diverse landscpae transformations on one hand with basic cultural atitude assessments on the other.

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The landscape research in France : theoretical frame and assessment methods

Les recherches sur le paysage en France : cadre théorique et méthodes d'évaluation

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Abstract: *The paper briefly reports on a field of research that is developing in France, focussing on the notion of «landscape». In the first part is explained the French theory of landscape, whose aims are to assess the people's views towards nature («social representations of landscapes») and the way those views are elaborated and changing. In the second part are described the methods used ; the methodological problems raised by the qualitative analysis of the views towards nature according to the inhabitants and to the general public are pointed out. In the third part, the assessment of the views on poplar stands is taken as an example (artistic representations, public perception). As a conclusion, the paper lays the stress on a present challenge which is the assessment of the social «demand», poorly expressed but truly existing, towards landscapes : in this respect, the qualitative assessment of the social representations of landscape opens new perspectives, compared with the the traditional «expert» approaches, but needs to be defined more precisely and to be associated with other approaches, like quantitative surveys.*

Résumé : L'article traite d'un champ de recherche en cours de constitution en France autour de la notion de «paysage». La première partie présente la théorie française du paysage, dont les buts sont l'identification des représentations sociales du paysage et de la façon dont ces représentations sont élaborées et évoluent. La seconde partie décrit les méthodes utilisées ; les difficultés méthodologiques soulevées par l'analyse qualitative des représentations sociales du paysage selon les habitants et le public en général sont soulignées. Dans la troisième partie est cité l'exemple des regards portés à la peupleraie (représentations artistiques, représentations sociales). La conclusion souligne qu'un enjeu actuel est l'identification de la demande sociale de paysages, réelle mais peu explicite : les méthodes d'évaluation qualitative ouvrent ici de nouvelles perspectives, comparées aux traditionnelles approches «d'expert», mais nécessitent d'être encore précisées et complétées par d'autres approches, comme les enquêtes quantitatives.

Introduction

«Landscape» is not a new word, nor a new idea. But, if artists have depicted it, if landscape architects have created gardens for centuries, landscape is still a new concept from the point of view of the researcher. This paper deals about the recent field of research that is developing in France, focussing on the concept of «landscape». It is an attempt to show that the landscape notion, as defined by this field of research, is appropriate to assess the people's views and preferences towards nature, and to understand better the way these views are changing.

To begin, the paper will explain what the French theory of landscape consists in. Then, it will describe the methods used, insisting mainly on the methodological problems raised by the qualitative analysis of the views towards nature according to the inhabitants and to the general public. Finally, very briefly, it will report the example of the analysis of the views towards poplar stands (the different examples cited within this paper are extracted from the same research : Le Floch, 1996).

1. The french theory of «landscape»

In France, «landscape» is now at the center of the reflection led by a group of researchers coming from different disciplines of the social and human sciences : philosophers, sociologists, geographers. (Berque, dir., 1994 ; Roger, dir., 1995...)

The landscape approach has two strongly linked aims :

- first, to identify the images, or the representations, that the people have in mind concerning some particular locations, or pieces of space.

- secondly, to identify, as far as possible, the influences that determine the elaboration of those images, their diffusion within the society, or their disappearence.

What can be called «landscape representations» are mental images of the real : that's to say, simplifying schemes of reality. They can also be called «social» representations, because they are usually shared by the different people of one or several particular social groups. The mental images can sometimes be translated into formal images : artistic representations, such as paintings, photographs, drawings. Those images don't only refer to aesthetic values, but refer to any value that can give sense to a particular location : economic, ecological, sensitive values...

The function of the landscape representations is to propose ways of thinking and ways of appreciating the concrete space and the nature ; representations guide the attitudes and the practices towards space and nature.

Concerning the elaboration of the landscape representations, two types of influences are determinent. First, culture in general elaborates some patterns that show us how to view and how to judge the landscape. The most famous are the artistic motifs : the visual images are modelling our view and our mind (Roger, 1978 ; Roger, 1991). But so do the mental images depicted in literary discourses or in poetry. Then, scientific and technical knowledges also produce ways of thinking and ways of appreciating the nature (Luginbühl, In Mathieu et Jollivet, dir., 1989). Nowadays, we can notice, for example, the growing influence of the ecological discourses.

Secondly, the vernacular culture also elaborates some images reflecting the relationships to space and to nature (Larrere, 1996). Here, landscape is the way the space and the nature are experienced by the individuals and by the social groups. Representations and practices (agriculture, recreation...) are closely depending one on another, constantly evolving together.

To sum up, landscape is the image of the real and concrete space and nature, plus the influences that determine the elaboration of the image. Regarding these influences, we consider that, beyond the characteristics linked to the individual (psychology), the main determinents are the social and cultural constructions. The representations of landscapes vary according to the geographic context, to the socio-economic data, and to the caracteristics of the social groups ; they're in constant evolution.

2. Assessment methods

2.1 General frame

The general aims of the landscape research (to understand the representations and their determinents) implies two major points.

First, fundamentally, the landscape approach is a qualitative approach, based on some qualitative analysis. Rather than taking a photograph showing the situation at a precise moment (the quantitative distribution of some stereotyped views), the aim is to identify and to go deeply in the understanding of the different types of views, and of the values that are laying beyond.

Second, it requires to carry on a research exploring different paths and different scales (Le Floch, 1996). According to the hypothesis that two main types of influences are determinent regarding our views on nature (arts and sciences, social experience of the concrete space and nature), we can distinguish two main steps for the landscape approach :

– the analysis of the landscapes' models of representation that belong to our cultural common heritage, at a global level ;

– the analysis of the landscapes' models of representation that nowadays exist in the general population, that's to say, the analysis of both the social representations towards nature in general and the social representations towards some particular areas, both of them being linked ; this implies to carry on some case studies.

In fact, the specificity of the approach is the adaptation of methods used by different social and human sciences, and to think about the way they can fit one with another.

2.2 Artistic and scientific representations of landscapes

Artistic and scientific representations of landscapes are images or discourses (texts) vehicled by paintings and photographs, literature, technical or scientific works (agronomy, forestery, ecology...). Their analysis suppose, of course, some specific knowledge ; but the methods used, that's to say content analysis applied to iconography or to discourse, that may also have their own limits, don't raise any major methodological question. So, they won't be debated here. Only the few principles guiding this part of the analysis will be cited.

The aim is not to carry on a pure historical study of the artistic and scientific ways of thinking (that's the aim of disciplines such as history of arts, epistemology...) : the aim is to determine the characteristics of the main patterns that may have been modelling our views and our minds. As a matter of fact, those types of images are more than some elite's views, as they often widely spread over the society.

The material to analyse is, for example, the European landscape painting that can easily be seen by a large part of the public, within great museums or throughout exhibitions, books... ; the work of some contemporary famous artists, the content of some important exhibitions or journals...

Just to mention, one important point that has been little studied until now, because of the difficulties that it implies : the ways the cultural representations are diffusing. The influences of arts and sciences are not so direct, going through different types of media, and then being modified (post-cards, posters, tourist guides, movies, school books...).

2.3 Social representations of landscapes among the general public

The analysis of the social representations towards nature among the general public should be the major part of the landscape approach.

Still, only a few researchers are focussing on the qualitative analysis of the views (Luginbühl, 1986 ; Kalaora, 1993), because it raises major methodological problems. What is at stake is the adaptation of the methods used by the social sciences to the evaluation of landscape as an expression of the relationships to space and to nature.

This step of the landscape approach has three purposes :

- to determine if some of the cultural representations previously identified are present in the general population ;

- to determine if the social practices (agriculture, recreation) generate some specific social representations of the landscapes.

- to determine the links between the social representations and the general and local contexts in which those representations are existing :

  * local social context : the characteristics of the social groups, their practices or uses towards the concrete areas ;

  * local geographic context ;

  * local and global cultural and historical contexts.

In order to be able to determine the influence of the local contexts (social and geographic contexts) on the landscape representations, the research has to be anchored on one or several concrete areas.

2.4 Non-directive interviews

When interviewing the general public about nature, we have to keep in mind a basic particularity : generally speaking, the individuals have few means to express their feelings towards nature, and find it very difficult just to speak about their own sensitiveness.

This point implies two rules that are closely linked. The first rule is to avoid to ask too precise questions included in a precise and pre-determined frame (questionnaires). The results will show the convergences or the divergences between the respondent's way of thinking and the pre-determined frame ; but, in some extent, it may not reveal what are the main concerns of the respondent. Moreover, the pre-determined frame may influence too severly the respondent, answering what he thinks he is supposed to answer...

The second rule is to avoid to ask questions that have to be answered just by «yes» or «no» : to understand deeply the social representations and the feelings towards landscapes, we have to let the people talk rather long.

In fact, the respondent must be able to speak as long as he wants, with his own vocabulary, about his activities, the places he likes the best, the points that he dislikes, the changes that he witnesses. The interviewer doesn't use any questionnaire but a framework where are listed the different topics that he wants the respondent to speak about.

A rule is not to ask directly a question about the «landscape», nor about a very particular subject or element (a particular tree species). In fact, what is interesting is to identify if landscape, or some particular elements, are part of the people's concerns towards their environment : we have to keep in mind that some particular elements might not be «seen» (or viewed), that the location studied might not be perceived as a «landscape» but as an ordinary piece of land... or might not be seen at all. For example, a study carried on in the villages near a large open space of wet meadows showed that some people don't have any mental representations for those kinds of meadows : they don't mention them in the interview, and don't even identify them on photographs (saying : «*It's ugly, it's boring ; that's not our region*»).

2.5 The choice of the interviewed people

Because the methods suppose long interviews, it's impossible to interview a large amount of people. The qualitative analysis is a statistically non-representative analysis. The qualitative interview is representative of the different types of views and preferences that exist among the population of the inhabitants and of the users, in relation with the practices and uses, and within a particular geographic, cultural and historical context.

Four categories of people can be distinguished, according to their links to the particular studied area.

- the «institutionnal» persons : public officers, members of associations, advisory services, that have a responsability in agriculture and forestery policies, land management, tourism development, nature preservation, hunting or angling. We have to keep in mind that, if the «institutionnals» speak in the name of the entire social group that they're supposed to represent, they have their own views and are involved in particular power influences, particular conflicts of interests...

Then, three categories of users properly speaking :

- the farmers and foresters, having a «daily» impact on the land

– the inhabitants in general : living in nearby cities and villages, or in isolated houses

– the external people that regularly or occasionnally come, for example to walk, to angle, to spend holidays...

The study must take into account the most diverse persons as possible within each of those three categories (age, gender, profession...).

Of course, the number of respondents vary, depending on the size of the area and on the characteristic of the population using the area. But we can consider that we have a good idea of the different types of views towards a marsh, or a forest, by interviewing about 50 persons living or using the marsh or the forest and their surroundings.

An interview can last twenty minutes if you interview an external tourist in the outside, to 2 or 3 hours if you interview an inhabitant at home.

2.6 The use of maps or photographs during the interview

It's very interesting to use maps or photographs during the interview, because it stimulates the respondent to speak (Deffontaines et Lardon, 1994). But there's some difficulties more concerning the interpretation of what is said.

The respondent can be proposed to comment a map of the area. The exercice reveals the preferential axis of circulation, the places usually used ; the view of the map can stimulate the imagination, and suggests the description of some particular landscapes or atmospheres or colours ; but it also reveals the «empty spaces», that's to say the places where the respondent projects no particular values.

The respondents can also be proposed to comment some photographs taken within the area or somewhere else. The exercice allow to identify what kind of images they really recognize as «their» landscapes. We can also have an idea on the way they could accept or reject a new element in their landscape, such as new types of forest stands.

But we have to be very cautious when interpreting the comments suggested by photographs. Photographs are already representations of the real (particular views towards reality). They pull the respondent out of the real spatial context and let him in an abstract context : the comments tend to become some general discourses, reproducing stereotypes. The feelings suggested by the photographs can't be understood as the feelings towards the real piece of land where the photographs have been taken.

Just one example, dealing with a young lady interviewed in the outside, just on the bank of the Garonne river, at the border of a typical poplar stand (straight rows, shaped trees, no undergrowth...). When looking at a photograph showing the same type of poplar stand, she first had a very sever comment : poplars were identified and said to be ugly, in total opposition with the idea of nature,... When looking at her surroundings, she didn't recognize any poplar stand, but a pleasant greenery enhancing the view on the river. When she was asked whether she knew a place where poplars have been planted, she feeled embarrassed and wasn't able to answer.

Example : views on poplar stands

Poplar stands are a very particular type of forest : in fact, they are not really forests, but plantations : they are straight rows of trees, without any undergrowth,...

First, poplar stands were invented at the end of the XIXe century, by an «elite», composed of some scientists but mainly of great land owners, especially wood industrial owners : they have planted and have developped a discourse in favour of such plantation entirely devoted to technical rationality and to economic profit.

Then, some artists -who have long depicted lines of poplars along pathroads or meadows- started to consider the same type of poplar stands, but from their own point of view. For example, poplar stands began to be depicted on some impressionnist paintings at the very end of the XIXe century, not as a major subject, but as an element of the landscape. Pissarro and Sisley depicted poplar stands nearby rivers, a favourite motif for those artists interested in a particular urban class discovering leisure in the valleys around Paris. Then, in the work of some contemporary photographers, poplar stands are sometimes a real artistic subject. The artists lay the stress on three points :

- the characteristics of the species : bright leaves and barks, spring and autumn colours, slender figures (André Martin...)

- the characteristics of the stand itself : geometrical effects of the rows and of the straight and shaped stems ; flooded stands are particularly valued, the water acting as a mirror and enhancing the geometrical effects (François Saint-Pierre...)

- the characteristics of the poplar stands in a larger area : contrast between open fields and a massive and geometric poplar plantation standing upon the horizon line (Fulvio Roiter...).

The interviews carried on within the present population reveal that the perception of poplar stands is not reduced to one or to the other of the previous perceptions (the technico-economic point of view *versus* the artistic point of view) : in fact, if both of

them exist in the public, they are not dominant and the situation is quite more complex.

A minor part of the public denounce the poplar stands, as the symbol of «anti-nature». This point of view is socially determined : it is due to some young urban people, from the middle-class, and having no particular contact with the rural area. In fact, we can draw an hypothesis : they dislike poplar stands because they have no pattern in mind, showing them how to interpret and how to appreciate. Poplar stands can't fit with the traditionnal representations of forest landscapes, and the recent artistic representations have not yet spread among larger part of the society.

The major part of the society is quite indifferent or appreciate poplar stands. The analysis reveals that this valuation is not only a confusion between the «Right» and the «Beautiful» («it' beautiful because it grows high and quickly») : a real aesthetic feeling exists, even among those who first denounce the poplar stands as «anti-nature». This kind of attitudes (which is frequent) may not be interpreted only as a contradiction, but reveals the complexity of the construction of the views towards nature. Two types of influences may be determinent. First, some users like it because they consider it as the visual symbol of the place where they spend their leisure time. Second, some may like it because the artistic representations have started to spread, as we can observe by looking in some recent popular magazines or books...

Conclusion

Nowadays, some researchers, but also some public officers who have a responsability on land management, become aware that the problems about the landscapes can't only be solved by the intervention of an external expert, describing shapes and colours and saying what the beautiful landscape is, without taking into account the shared values of the local populations.

Nowadays, what is at stake is the identification of the feelings of the local population and of the general public towards nature. Socially speaking, there's a real demand from the whole society and not only from some minor social groups ; in France, this demand has been legitimated by the «Landscape Law» (loi «Paysages»), passed in 1993. The problem is that this social demand is quite undetermined, or very badly expressed. In such a context, the qualitative approaches are first required, in order to get a deep and precise understanding of the views and of the values shared by the general public, which have long been ignored. Carried on without this necessary and preliminary knowledge, questionnaires are often and only reproducing stereotypes, and act as a poor mirror of the people's expectations.

But, in a second phase, once the qualitative approach has identified the values and their evolutions, a quantitative approach can be carried on, to get an idea of the quantitative distribution of the different views among the general population. Then, the questionnaires can be used as an appropriate technique. But we can also use a technique called «association of words» (not so pre-determined as questionnaires), or many others (Le Floch, 1996)...

But, whatever we do to identify the different views towards nature as precisely as possible, a major question finally remains : among all the different views of the different social groups concerned by a specific area, which one should to be chosen, or how to elaborate a new view on the area that may allow the emergence of a common proposal concerning the land management ? But this question of the «social negociation» is, of course, another question...

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Chestnut landscapes in the Cevennes (France) : an economic appraisal of its uses and its perception from the perspective of local actors

Le paysage de châtaigneraie dans les Cévennes ; une évaluation économique de ses usages et de sa perception par les acteurs locaux.

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Abstract: *The chesmut landscape in the Cevennes mountains is a typical example of agricultural lanscapes undergoing transformation. Though actually reduced and dispersed, landscapes of chestnut are still considered part of the region's identity. Tourism and the reduction in forest fire hazards, further explains currents interest in the future of the chestnut in the cevennes. The paper gives the outcomes of a study performed in two areas where chestnut are playing different roles. Two types of surveys were attempted :*

– one survey focused on the "supply of landscape" directed towards agriculturists who managed their chestnut woods.
– one survery foursed on the "demand of landscape" which aimed at defining users behaviour and the perception of landscape.

300 interviews were made for the second survey using a series of photos to define user preferences, and an appraisal of the willingness to pay (WTP) for a project which aims at the rehabilitation of 1000 hectares of old chestnut forest. The work identifies different chestnut uses and the different actors involved. It can help to predict possible use conflicts.

Résumé : La châtaigneraie dans la montagne cévenole est un exemple typique de paysage agricole en transformation. Bien qu'actuellement réduits et dispersés les paysages de châtaigneraie sont toujours considérés comme faisant partie de l'identité régionale. Le tourisme et la réduction des risques d'incendie de forêt expliquent également l'intérêt actuel pour la châtaigneraie dans les Cévennes. L'article donne les résultats d'une recherche conduite dans deux secteurs où le châtaignier joue des rôles différents. Deux catégories d'enquêtes sont menées :

– une enquête axée sur "la production de paysage" réalisées auprès des agriculteurs qui gèrent leurs châtaigneraies.
– une enquête sur "la demande de paysage" qui vise à préciser le comportement des usagers et la perception du paysage.

300 interviews sont réalisés pour la seconde enquête, en faisant appel à une série de photos pour définir les préférences des usagers, et une évaluation du consentement à payer pour un projet de réhabilitation de 1000 hectares d'anciennes châtaigneraies. La recherche identifie différents usages de la châtaigneraie, et les différents acteurs impliqués. Elle aide à prédire d'éventuels conflits d'intérêts.

1. The socio-economic context

The Chestnut landscape in the Cevennes mountains is a typical example of agricultural landscapes undergoing transformation. As the product of a long history, the investment required to construct these landscapes was originally justified by commercial values: through the production of fruit (chestnuts) and wood. Though reserved mainly for auto-consumption, there was nevertheless a price corresponding to the production of material goods. From the end of the 19th century onwards, the following factors combined to bring about a crisis in a social system which had developed over several centuries: industrial growth in France and the development of transportation infrastructures offered new employment opportunities for the rural workforce.

Chestnut tree diseases added to the opportunity cost of harvesting and accelerated the processes of land abandonment. Economic stability, based on the harvesting of Chestnuts for fruit and wood production, was disrupted. Man's impact through agriculture - and also through agroforestry (by associating different production objectives for the same section of land: Chestnuts, timber, firewood, livestock) - had left landscapes characteristic of land-use in a difficult environment.

Today, the geographic range of the Chestnut in the Cevennes still covers 41 000 hectares. Though actually harvested over an area that is quite reduced, dispersed, and heterogenous, landscapes of Chestnut are still considered part of the region's identity. Contemporary economic reasons, notably tourism and the reduction in forest fire hazards (when undercover is removed in the Chestnut woods), further explain current interest in the future of the Chestnut in the Cevennes.

2. Appraisal of public behaviour and perception

Two areas were selected for our study: the Vallée Française and the Vallée du Galeizon. This choice was based on 3 criteria: The presence of harvested chestnuts, the proximity of an economic area, and the role that the Chestnut plays in land management.

The following table gives the parameters of these two sites with respect to these criteria.

	Presence of harvested Chesnut woods	Proximity to the economic area	The role of the Chestnut woods in land management	Agro-environmental mesures with landscape objectives
Vallée Française	Agricultural activity continues in relation with the harvesting of chestnuts (for fruit and grazing)	Located in the heart of the Cevennes	Local discussions regarding the rehabilitation of Chestnut woods in agricultural zones	Yes
Vallée du Galeizon	Area marked by the abandonment of Chestnut harvesting and the invasion of other tree species	Located near the city of Ales in the « backcountry cevenol »	Application made to maintain Chestnut woods as « green fire-breaks » in the event of forest fire.	Yes

The Vallée Française offers a panorama over the largest Chestnut zone in the Cévennes. These Chestnut woods , largely abandoned, still clearly mark the landscape. The total surface area of the valley is just over 95 km2 which is divided between 7 communes. There are 358 permanent residents and 395 secondary residents over the whole of the valley. The SAU (usable agricultural land) takes up 23% of the valley's total surface area, and includes 76 farming operations (of which 43 are full-time). Agriculturists represent 46% of the active population. Tourism is common during the summer but also extends into the autumn for the harvesting of chestnuts and mushrooms.

The vallée of Galeizon is much less isolated and is even considered the «green lung» for the neighbouring city of Ales. Its surface area is comparable that of the Vallée-Française with a little more than 83 km2. Tourist use is also an important local activity in the summer though it can be more spread-out over the entire year. However, tourism remains concentrated around Cendras (the town that links Ales with the cevenol back-country) and in the inferior part of the valley with the river (Galeizon) being main attraction. Chesnut woods, though still omnipresent, are largely abandoned and often invaded by other tree species. Agriculture is less present than in the Vallée-Française: the SAU covers 9.5% of the valley's surface area and the agricultural population represents 30% of the active population (including 70 operators of which 37 are full-time).

3. Two types of surveys were attempted

– one survey focused on the supply of landscape. It was directed towards agriculturists who managed their Chestnut woods in order to identify its place in the farming system. This survey identified different management objectives with respect to the Chestnut and corresponding impacts on the landscape. It also allowed for an analysis of the role of subsidies. Motivations related to the availability of such aids were also defined.

– the other survey dealt with the demand for landscape. It aimed to define user behaviour and the perception of landscape in the two selected study sites. The choice of two areas with different parameters allowed us to test an hypothesis for the evolution of preferences given the actual state of the landscape. The heritage value of landscape was stratified according to the « level of involvement » for each person surveyed. The « level of involvement » was defined by residential status: permanent resident, secondary resident, or vacationer. A survey was done for 76 vacationers during the summer of 1996. It served as a preliminary survey before establishing the final questionnaire.

The results of this preliminary survey are resumed in the following table:

– the Vallée du Galeizon (site A) has lost its vocation for agriculture even though the Chestnut is still omnipresent;

– the Vallée Française (site B) is still influenced by Chestnut harvesting.

«Have you had to opportunity to see Chestnuts during your stay?»

The Chestnut is more often identified on the site where it is still maintained by agricultural activity.

«Do you consider Chestnuts to be particularly important in comparison with other trees?»

The Chestnut is considered most often as a characteristic tree on the sites where it is still harvested.

«Is the Chestnut orchard a heritage to be conserved?»

For the majority of people surveyed, the Chestnut orchard remains a symbol of the Cevennes which deserves heritage protection.

The final survey was just completed. The three user-types mentioned above were surveyed with a total sample of 300 persons. The following methodology was employed:

– the use of a series of photos to define user preferences, in association with questions clarifying their choices;

– an appraisal of willingness-to-pay (WTP) which, in our case, aims to define the demand for a certain type of landscape. The following hypothetical scenario was proposed in the survey: « The valley's communes (in Vallée-Française or in the Vallée du Galeizon) have agreed to initiate a project that aims to rehabilitate 1000 hectares of old Chestnut forests mainly around villages. This corresponds approximately to 10% of the valley's surface area. Financial aid to eligible owners of Chestnut woods, whether agricultural or not, is expected in order to compensate for brush clearing and for pruning of dead branches. The program's objective is strictly landscape oriented: the aids would not depend on the commercial value of Chestnut products (chestnuts and wood). This program would be partly financed by an increase in property tax for permanent and secondary residents as well as an increase in vistors's tax for vacationers. As a resident (or a vacationer) would you be prepared to see your property tax (or visitor's tax) increase in order to support such a project? »

4. Agricultural practises and Chestnut woods

The Chestnut has lost much of the vocation for agriculture that it had until the middle of this century. The majority of agriculturists have turned towards other more profitable production. Chestnut lots are also have little value for forestry production because of problems that range from tree care to marketing. These difficulties can compound in a vicious circle: low wood quality (Chestnut roulure, for which its causes are poorly understood), weak prices offered by the wood transformation industry, high transportation costs (due to poor access and difficult topography). For all of these reasons, many proprietors prefer to declare their most degraded Chestnut woods as « landes » (heathland) to lower their property taxes. They also conserve better Chestnut lots as orchards in order to be eligible for subsidies. (Classifying them as forest would permit proprietors to benefit from a 30 year tax exemption if they are willing to invest in reforestation. Given the high opportunity cost of such an action, incentives might prove to be more effective).

In reality, being that Chestnuts are omnipresent, farm operators try to draw some benefit and the chestnut is still harvested marginally on less degraded and/or more accessible lots. Different reasons, often in combination with each other, can be identified:

– when the farm production system is mainly oriented towards raising livestock, significant brush clearing occurs in the Chestnut woods when grazing of nuts is substituted for livestock feed. Typically, grazing under Chestnuts provides a large part of nutritional requirements during the fall and during part of the winter.

– when the size of the operation is limited and obtaining additional lands is difficult, the limited choice of production systems is a constraint in itself.In such cases, the opportunity cost of chestnut harvesting is reduced and the chestnut woods carry more valued.

– finally, Chestnut lots close to the base of the farming operation are preferred because of their accessibility, because of the need to keep residence surroundings clean (mainly in the event of fire) and finally, for aesthetic reasons. This last point is often emphasized by those people who have already participated in rehabilitation actions in their Chestnut woods. Whereas a direct economic calculation would be unfavorable to a decision to invest in Chestnut woods, a favorable decision can result by taking into account the willingness to value the landscape, not to mention the importance of the Chestnut as part of the cevenol identity.

Conclusion

Chestnut woods in the Cevennes represent a space with a multiplicity of actors and uses. Agriculture no longer provides the main impetus for economic structuring. This evolution might be further analysed by looking at the coordination of public policies. As a step in that direction, the work presented here seeks to identify different Chestnut uses and the different actors involved. Eventual use conflicts might be better predicted - without forgetting that a non-use can also be a source of conflict. In particular, a lack of coordination can result when residual institutions and regulations no longer satisfy their initial function, and yet continue to govern the distribution of rights over a new territorial reality. This is important in the Cevennes where conflicts persist despite a population density of less than 10 habitants per hectare and much unmanaged land. Consequently, existing institutions and regulations do not always meet the expectations of the actors involved.

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Part II

Attitudes of farmers and forest owners

Forests for recreation?

Attitudes of interest groups and political actors towards forestry as a provider of recreation in Austria

Des forêts pour la récréation ?

Attitudes des groupes d'intérêts et des responsables politiques envers une forêt consacrée à la récréation en Autriche

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Abstract: *Forestry is confronted with increasing demands regarding recreation. These demands are heterogeneous and range from action sports to the desire to have undisturbed experience of nature. From a political point of view it is interesting to analyze the attitudes of interest groups and political experts regarding recreation issues. The paper reflect the outcomes of a study on recreation in austrian forest, finished in spring 1997. The methodological approach is based on expert-interviews (Meuser/Nagel 1991). 27 interviews were made in five interest groups : tourism, nature conservation, forestry, bureaucracy and political parties. The main outcome is that forest owners find themselves in a favorable environment to sell recreation products. Almost all experts support the idea that forest owners have to respond in an entrepreneurial way to the demands of society. Political parties have a weak position on this question, which makes them easily influenced by interest groups.*

Résumé : La forêt est confrontée à une demande croissante concernant la récréation. Cette demande est hétérogène et concerne autant les sports d'action qu'un désir de fréquentation d'une nature non perturbée. D'un point de vue politique, il est intéressant d'analyser les attitudes de groupes d'intérêts et d'experts politique à l'égard des enjeux de récréation. L'article donne les résultats d'une recherche achevée au printemps 1997 sur la récréation dans les forêts autrichiennes. L'approche méthodologique fait appel à des "interviews d'experts" (Meuser/Nagel 1991). 27 interviews ont été réalisés auprès de 5 groupes d'intérêt : tourisme, protecteurs de la nature, forestiers, bureaucrates et partis politiques. Le principal résultat est que les propriétaires forestiers s'estiment dans des conditions favorables pour vendre des produits de récréation. Presque tous les experts soutiennent l'idée que les propriétaires doivent développer une attitude d'entrepreneur pour répondre à la demande de la société. Les parties politiques ont sur ce sujet une position faible qui les rend facilement influençables par les groupes d'intérêt. L'attitude des experts varie en fonction des cinq groupes prédéterminés.

Introduction

The background of the following paper was the observation that forestry is confronted with increasing demands regarding recreation. These demands are heterogeneous and range from action sports to the desire to have an undisturbed experience of nature. Nature conservationists and hunters are also relevant interest groups. Because recreation in forests has such a wide variety of meanings to different persons and groups there is a high potential of conflict. From a political point of view it is therefore interesting to analyze the attitudes of interest groups and political experts towards forestry regarding the competence in recreation issues.

1. Economic and political background

The main topic in Austria with regard to recreation in forests is mountain biking (MB) on forest roads. While there is a great demand for this activity, forest owners emphasize their right to restrict mountain biking because of legal aspects and favor a solution where mountain bikers have to pay a fee when they are using forest roads. Mountain bikers on the other hand aim at a free access to all forest roads for biking and call for the use of forest roads without a charge. However, the discussion about mountain biking indicates the political, but also the economic relevance recreation in forests can have. One could argue that in principle it should be possible for foresters to gain an additional income from selling non-timber products in general (Glück 1995), and recreation products in particular.

Although the tread on forests for recreation is allowed for everybody and regulated by the Austrian Forest Law, it can be demonstrated by the economic theory concerning public and private goods that it could be possible to market special recreation products. According to this classification recreation in Austrian forests is a public good, which means that persons who want to visit forests can not be excluded[1] from using forests for that purpose. Besides the use of a forest for recreation is not rival (in an ideal form). The opposite of public goods are private goods where excludability as well as rivalry can be applied. This means a certain good can only be used by one person at the same time.

[1] The distinction of public and private goods can be described through the degrees of excludability from consumption and rivalry of use. Compare the controversial discussion about this distinction in Malkin/Wildavsky 1991, Adams/McCormick 1993, Cornes/Sandler 1994.

private goods	impure public goods	public goods
excludable and rival	partially rival and/or partially excludable	non-excludable and non-rival

Table 1: Classification of goods

Nevertheless this differentiation into private and public goods is not sufficient to label all potential goods (table 1). Goods which are neither public nor private can be described as impure public goods (Cornes/Sandler 1986; Sandler 1992). They constitute a continuum between the two ideal poles and can be characterized through varying degrees of excludability from consumption and rivalry of use. One important variety of impure public goods are toll goods or club goods (Cornes/Sandler 1986) which are characterized by the possibility to exclude non-payers from consumption but unlike private goods more than one person can use these goods at the same time. Excludability from use logically suggests that toll goods - which can be recreation products - can reach a market price and can therefore be a source of additional income for forest owners. The precondition in this regard is the development of products that are more than external economies (Mantau 1994, 1995). This would further imply a demand-oriented establishment of recreation products by foresters.

Given the fact that recreation products can reach a market price, the question remains whether market place solutions or state interventions could be feasible for their provision.[2] Without going into further detail it can be argued that a distinction into private goods and public goods is dependent on a normative political decision and is subject to (constant) change (Malkin/Wildavsky, 1991). This implies that the same recreation forest service can be provided either by the market place or by state intervention according to the political culture of a country.

2. Outline of the study

The following outline and results on recreation in forests in Austria reflect the outcomes and the theoretical basis of a study finished in spring 1997.[3]

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[2] One possible distinction is a differentiation into desired products that society should be provided with from a social point of view and other services. For the discussion of market place versus state solutions compare e.g. Glück/Mayer 1996.

[3] The study was supported by the Austrian Federal Ministry of Agriculture and Forestry. For detailed results compare Mayer (1997).

The research approach of the study is based on the concept of the political situation analysis, which can be used in such cases where short termed non-static relations between different political actors prevail (Prittwitz 1994). This logically suggests that no established policy-network exists. Since no long-term relationships or negotiating practices concerning recreation in forests have been established so far, and the issue of recreation in forests was supposed to be dynamic concerning the opinion-making and opinion constellations, the political situation analysis was considered to be a proper research approach for the study. The objective was to pick out the current influence, value, and opinion constellations of political experts as a central theme of the study to get an idea of the attitudes towards recreation on a political level

2.1 Methodological approach

The methodological approach corresponding to the political situation analysis was the expert-interview. It is especially used in situations or for research tasks where quantitative information is not helpful to clarify political science-oriented problems.

The characteristics of the expert-interview are the following (Meuser/Nagel 1991):

– the interview is determined by the interviewee, which means that the interviewer plays a passive role during the whole interview.

– the interviewer tries not to intervene in how the interviewee is answering questions or structuring his answers.

– nevertheless it is helpful (and in some cases necessary) to use an interview-guide which is prepared in advance and based on the theoretical work and the knowledge concerning the field of study of the researcher. An interview-guide helps the researcher to identify all problems that should be addressed.

Having in mind the fact that the interviewee is the one who determines the interview, it becomes clear that each interview has a different structure. However, the interviewed person is not the focus of the interview. The important factors are the context and the representation of the expert.

This leads to the question, »What is an expert?". An expert by definition is somebody who is responsible for the outline, implementation or control of solving a problem and somebody who has privileged access to information about groups of persons or decision-making processes (Meuser/Nagel 1991). Following this definition it is obvious that private experiences or individual biographies of the experts are excluded from the analysis of the interview.

The problem-oriented interview was thought to be a useful addition to the expert-interview to establish a sound theoretical framework for the empirical work.

The problem-oriented interview constitutes a combination of methods by linking the quantitative and the qualitative approach and therefore allows to ask specific questions, if an important issue was not addressed in the course of the interview. The researcher has also a theoretical concept from the beginning,[4] which is constantly modified and tested through the interviews (Lamnek 1989).

2.2 Analysis of the interviews

Political science theory presents no strict rules on how qualitative interviews have to be analyzed. It is argued that the researcher has to adapt his or her analysis to the specific project (Lamnek 1989) although some basic recommendations are made. Considering these recommendations of the social science literature the following seven steps have been developed:

– transcription of the interview;

– chronological analysis of the content of each interview and identification of themes per interview;

– comparing all interviews and finding out the main focuses - the chronological order of the interview is removed with this step;

– theme matrixes organized around groups of interview-partners;

– theme-oriented presentation of all interviews according to groups;
theme-oriented analysis and discussion of the findings of the interviews;

– conclusions

2.3 Selection of experts

One important part of the empirical work is the selection of the experts. The selection criteria used for the study were highest political representation of interest groups and bureaucracy. For the political parties the forestry-speakers where chosen. The main emphasis for selecting the experts was put on the political function and importance of the actors rather than focussing on forestry experts with less political influence.[5]

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[4] The concept is not explained to the interviewees.

[5] This ensues from the underlying motive of the study, which is to analyse the current political situation. In the cases where it was not possible to interview the top representative of each group, the persons that where nominated as substitutes from these organisations were accepted.

In total 27 interviews were made and divided into five groups - three interest groups (tourism, nature conservation and forestry - split into employers and employees), bureaucracy and political parties (including the Austrian Minister for Agriculture and Forestry) (Annex 1). The interviews took between 45 and 90 minutes and where carried out at the locations the experts suggested. The interview was made in a verbal form and taped.[6] The main outcomes of the interviews are presented in chapter 4.

3. Results of the study[7]

3.1 Attitudes towards forestry

As a general observation it can be said that especially the experts of interest groups and bureaucracy seemed to have profound knowledge about recreation in forests. On the contrary the representatives of the political parties made a rather uninformed impression.

The attitudes towards forestry as a whole vary significantly (table 2). While a coalition of forest interest groups, the Austrian People's Party (ÖVP), the Federal Ministry of Agriculture and Forestry (BMLF) and the Austrian Minister of Agriculture and Forestry (HBM) strongly supports and accepts forestry in its current state, especially nature conservation groups, tourism interest groups and most political parties emphasize the limited acceptance of forestry in its current state. The main argument for that attitude is the supposed economic orientation of forestry, which is not emulating nature in its forest practices.[8] The same argument is brought forward by the employees - however this group in general emphasizes the close relation to forestry. ÖGB and LAK both stress the need of securing jobs for employees in forestry in connection with most of their statements.

Addressing the attitudes towards the competence of forestry regarding recreation in forests especially nature conservationists, but also tourism experts are very skeptical. Surprisingly the Austrian Federal Forests (ÖBF) seem to share that view, but their argument differs. They are of the opinion that it does not make sense to be too active in recreation tasks at all.

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[6] Except for one interview which was made in November 1996 the interviews were carried out between May and July 1996.

[7] In the following tables «X» means that the interviewed person was actively or strongly implicitly raising this point. Abbreviations are explained in Annex 1.

[8] Still some of the tourism and nature conservation groups admit that forestry has changed and is moving towards more nature-oriented forest practices.

Group		Acceptance	Limited acceptance	Skepticism regarding recreation
Tourism	ÖW			X
	WK	X		
	ÖHV		X	
Nature Conservation	GP		X	
	WWF		X	
	ÖGNU			X
	ÖNB		X	X
	NFÖ		X	X
	OeAV		X	
Forestry	ZJV	X		
	ÖBF			X
	PRÄKO			
	HV	X		
	ÖFV	X		
Employees	LAK	X		
	ÖGB	X		
Bureaucracy	BMW	X		
	BMF			
	NBK	X		
	BMU		X	
	BMLF	X		
Political Parties	HBM	X		
	SPÖ		X	
	ÖVP	X		
	FPÖ		X	
	LIF		X	
	Grüne			

Table 2: Attitudes towards forestry

3.2 Expected role of forestry

The role that the experts think forestry should play differs as well (table 3). While nature conservationists want forestry to perform an ecological forestry, the experts on tourism emphasize the preservation of landscape as an important role. This is surprising because one could have expected that especially tourism-experts consider the role of forestry mostly in responding to the demands of society, e.g. sport activities. The main emphasis in this regard is brought forward by bureaucracy and political parties.

Timber production as an expected role of forestry was not explicitly raised by the forest interest groups. However, it can be assumed that in accordance to the other attitudes foresters shared during the interviews, wood production implicitly is considered to be the dominant role for forestry.[9]

PRÄKO and ÖFV also see a role of forestry in responding to the demands of society and following silvicultural practices emulating nature. Of course, when saying this, they always emphasize the need of restricting or forbidding recreation activities as an important option.

3.3 Expectations regarding recreation in forests

Especially tourism experts are very homogeneous in their expectations, whereas bureaucracy experts very much reflect the opinions of their related fields (table 4).

The priority in expectations of almost all groups was linked to MB on forest roads. There was consensus among almost all groups that this issue should be solved in the near future. Nevertheless especially forest interest groups, as opposed to all other interest groups, have differing concepts of how this solution should look like (see chapter 3.5).

[9] Especially the Austrian Federal Forests (ÖBF) stressed the undisputed priority of wood in the evaluation of all other services of forests.

Group		Preserving the landscape and nature	Responding to the demands of society	Timber production
Tourism	ÖW	X		
	WK	X		
	ÖHV	X		X
Nature Conservation	GP	X	X	
	WWF	X		X
	ÖGNU			
	ÖNB	X		
	NFÖ			
	OeAV		X	
Forestry	ZJV			
	ÖBF			
	PRÄKO		X	
	HV	X		
	ÖFV		X	
Employees	LAK			
	ÖGB			X
Bureaucracy	BMW	X		
	BMF	X		X
	NBK		X	
	BMU		X	
	BMLF		X	X
Political Parties	HBM		X	X
	SPÖ	X	X	
	ÖVP		X	X
	FPÖ			
	LIF	X	X	
	Grüne	X		X

Table 3: Expected role of forestry

Group		Forest preservation	Solving MB - issue	Behavior in forests in conformity with nature
Tourism	ÖW	X	X	
	WK	X	X	
	ÖHV	X	X	
Nature Conservation	GP	X		
	WWF			
	ÖGNU	X	X	X
	ÖNB	X	X	
	NFÖ	X		X
	OeAV	X	X	
Forestry	ZJV		X	X
	ÖBF		X	X
	PRÄKO		X	X
	HV			X
	ÖFV		X	
Employees	LAK	X	X	
	ÖGB		X	
Bureaucracy	BMW		X	
	BMF	X		
	NBK	X		
	BMU	X	X	
	BMLF		X	
Political Parties	HBM		X	X
	SPÖ	X	X	
	ÖVP		X	
	FPÖ	X		
	LIF		X	
	Grüne	X		

Table 4: Expectations regarding recreation

Other expectations concerning recreation in forests were the increase in preservation and conservation activities in forests - except for the forest interest groups - and that foresters in general should show more willingness to communicate with other groups.

Although the experts of the forestry interest groups also emphasized the need to solve the MB-issue and demand more communication as well, it becomes obvious that the conflict is not likely to be solved in the near future. Forestry experts also hope that the behavior of visitors in forests improves and will be in conformity with nature. This is one of the rare agreements with nature conservation groups.

With regard to the political parties it was rather unexpected to realize that the Austrian People's Party (ÖVP) is favoring the opening of forest roads rather than supporting the foresters as they do in most other issues. The reason for that behavior is the support of the ÖVP for the tourist industry. However, recently the ÖVP voted against opening of forest roads for MB.

3.4 Recreation goals

In connection with the expectations the recreation goals of all experts show very much their professional background (table 5).

Non-conflicting activities in forests are relaxation, hiking, berry and mushroom picking etc. Sport activities as a goal were emphasized by tourism groups and NFÖ and OeAV.[10] But also the Minister of Agriculture and Forestry (HBM) supports sports activities as a recreation aim.

A controversial goal is conservation of forests. Especially nature conservation groups identify conserved forests with recreation. It seems that this attitude was also adopted by the political parties since conservation of forests and nature is their most important goal regarding recreation.

Forest interest groups on the contrary think that the present level of forests is sufficient for meeting recreation goals. The only group that explicitly mentions hunting as a recreation goal are the Austrian Federal Forests (ÖBF).[11]

[10] OeAV and NFÖ can be described as »Alpine Associations" which in addition to nature conservation have recreation goals.

[11] Although especially the political parties reflected the importance of hunting activities as forest policy issue in some of their statements.

Group		Sport	Relaxation	Nature
Tourism	ÖW		X	
	WK	X	X	
	ÖHV	X	X	
Nature Conservation	GP			X
	WWF		X	
	ÖGNU			X
	ÖNB			X
	NFÖ	X	X	X
	OeAV	X	X	
Forestry	ZJV		X	
	ÖBF			
	PRÄKO			
	HV		X	
	ÖFV			
Employees	LAK		X	X
	ÖGB			X
Bureaucracy	BMW	X		X
	BMF			
	NBK		X	
	BMU			X
	BMLF			
Political Parties	HBM	X		X
	SPÖ			X
	ÖVP		X	
	FPÖ		X	X
	LIF	X	X	
	Grüne			X

Table 5: Recreation goals

3.5 Attitudes towards MB on forest roads

As pointed out before MB is the most important task on the political agenda. While tourism and some nature conservationists oppose any fee that could be charged for MB on forest roads, the majority of the interviewed experts would accept a »realistic» fee for MB (table 6). Realistic means in particular as opposed to the proposal of the Austrian Federal Forests (ÖBF)[12] which almost everybody, except for the forest interest groups, considered to be too much. Forestry experts are

[12] About ATS 8 per meter.

supported in their view by the Federal Ministry of Finance (BMF) and the Federal Ministry of Agriculture and Forestry (BMLF).

Group		No fee for MB	Realistic fee for MB	Proposed fee of ÖBF acceptable
Tourism	ÖW	X		
	WK	X		
	ÖHV		X	
Nature Conservation	GP		X	
	WWF	X		
	ÖGNU		X	
	ÖNB		X	
	NFÖ	X		
	OeAV		X	
Forestry	ZJV		X	
	ÖBF			
	PRÄKO			X
	HV			X
	ÖFV			X
Employees	LAK			X
	ÖGB		X	
Bureaucracy	BMW			
	BMF			X
	NBK			
	BMU		X	
	BMLF			X
Political Parties	HBM			
	SPÖ		X	
	ÖVP			
	FPÖ			
	LIF		X	
	Grüne		X	

Table 6: Attitudes towards MB on forest roads

3.6 Attitudes towards commercializing recreation products

Knowing the positions regarding MB the attitudes towards commercializing of recreation products in general are surprising. It can be shown that almost everybody would be willing to pay for recreation products, if an additional benefit to a basic benefit is produced - that means an identifiable product is developed

(table 7). On the other hand it was also clear for almost all experts that a general entrance fee for forests is unacceptable.

Group		Marketing of products	No entrance fee for forests
Tourism	ÖW	X	X
	WK	X	X
	ÖHV	X	X
Nature Conservation	GP	X	X
	WWF	X	X
	ÖGNU	X	X
	ÖNB	X	X
	NFÖ	X	X
	OeAV	X	X
Forestry	ZJV	X	X
	ÖBF		X
	PRÄKO	X	X
	HV	X	X
	ÖFV	X	
Employees	LAK	X	X
	ÖGB	X	
Bureaucracy	BMW	X	X
	BMF	X	X
	NBK	X	X
	BMU	X	X
	BMLF	X	X
Political Parties	HBM	X	X
	SPÖ	X	X
	ÖVP		X
	FPÖ		X
	LIF	X	
	Grüne	X	X

Table 7: Attitudes towards commercializing recreation products

The crucial task with respect to an economic utilization of the recreational (and related) demands therefore seems to be the development of recreation products. This would mean that foresters have to adopt an entrepreneurial attitude. However, this attitude can not be identified by the outcomes of the study.

Within forestry the Association of Forest Owners (HV) is the most optimistic and progressive about the development and commercialization of recreation products.

All other forestry experts (supported by ÖGNU) seem to be rather skeptical about the (economic) advantages that selling of recreation products could have.

3.7 Future chances of forestry

An unexpected outcome of the study are the attitudes of the interviewed experts towards future chances of forestry. These attitudes are in contrast to the opinions about the current role of forestry that the experts mentioned at the beginning. Most experts judge the role of forestry in the future as constantly important. Interestingly the Austrian Federal Forests (ÖBF) and the Austrian People's Party (ÖVP) are skeptical about this importance of forestry for the future.

Group		Importance Increasing	Importance constant	Importance decreasing
Tourism	ÖW	X		
	WK		X	
	ÖHV		X	
Nature Conservation	GP		X	
	WWF			X
	ÖGNU			
	ÖNB		X	
	NFÖ		X	
	OeAV			
Forestry	ZJV		X	
	ÖBF		X	X
	PRÄKO		X	
	HV	X		
	ÖFV		X	
Employees	LAK	X		
	ÖGB		X	
Bureaucracy	BMW		X	
	BMF	X		
	NBK			
	BMU		X	X
	BMLF		X	
Political Parties	HBM		X	
	SPÖ		X	
	ÖVP			X
	FPÖ		X	
	LIF		X	
	Grüne		X	

Table 8: Future chances of forestry

Conclusion

The most important outcome of the study is that in principle forest owners in Austria find themselves in a favorable environment to sell recreation products. Almost all relevant political experts support this idea under the assumption that the forest products are not only external economies. Some additional benefits to the basic benefit have to be supplied. This means that it is mainly up to the forest owners to respond in an entrepreneurial way to the demands of society.

From a political perspective it becomes clear that the political parties have weak positions with regard to forestry in general and recreation in forests in particular. This makes them easily influenced and open for lobbying activities by interest groups.

Concerning the attitudes of the experts it can be concluded that the pre-differentiation into groups prevails. Within forestry the Association of Forest Owners (HV) seems to be the most progressive interest group with regard to marketing recreation services. Bureaucracy in most cases shares the attitudes of their related subject. Whereas tourism experts shared homogeneous attitudes, nature conservation groups are more heterogeneous concerning recreation in forests. Especially the Alpine Associations (OeAV and NFÖ) seemed to be linked more to the attitudes of tourism than the other nature conservation groups.

Annex 1: Interest Groups and Abbreviations

Tourism:

ÖW:	Austrian National Tourist Office
WK:	Austrian Federal Economic Chamber
ÖHV:	Austrian Association of Hotel Owners

Nature Conservation:

GP:	Greenpeace Austria
WWF:	World Wide Fund for Nature Austria
ÖGNU:	Austrian Society for Nature Conservation and Environmental Protection
ÖNB:	Austrian Association of Nature Conservation
NFÖ:	Friends of Nature Austria
OeAV:	Alpine Association Austria

Forestry:

ZJV:	Austrian Association of Hunters
ÖBF:	Standing Committee of the Presidents of the Austrian
PRÄKO:	Chambers of Agriculture Austrian Federal Forests
HV:	Association of Austrian Private Farm and Forest Owners
ÖFV:	Austrian Forestry Association

Employees:

LAK:	Federal Chamber of Employees in Agriculture and Forestry
ÖGB:	Austrian Federation of Trade Unions

Bureaucracy:

BMW:	Federal Ministry of Economic Affairs
BMF:	Federal Ministry of Finance
NBK:	Conference of Civil Servants in Nature Conservation
BMU:	Federal Ministry of Environment, Youth and Family Affairs
BMLF:	Federal Ministry of Agriculture and Forestry

Political Parties:

HBM:	Austrian Minister for Agriculture and Forestry
SPÖ:	Austrian Social Democratic Party
ÖVP:	Austrian People's Party
FPÖ:	Austrian Freedom Party
Grüne:	Green Party
LIF:	Liberal Forum

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Space and place in finnish farmers' and advisors' attitudes to field afforestation[1]

L'espace et le local dans l'attitude à l'égard du reboisement des terres agricoles, des agriculteurs finlandais et de leurs conseillers

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Abstract: *Resistance to field afforestation as a land use policy instrument contains an emotive content. Evidence is presented to suggest that this resistance is related to farmers' and advisors' ties-to-place. Advisors' maintenance of the institutional social space of their sector of the economy seems to hinder their encouragement of field afforestation policies at the local level.*

Key words: *Field afforestation, social space, ties to place*

Résumé : La réticence au reboisement des terres agricoles comme élément d'une politique d'utilisation de l'espace a un côté émotionnel. Les résultats présentés suggèrent que cette réticente est expliquée par le lien au local des agriculteurs et de leurs conseillers. La conservation par les conseillers de l'espace social institutionnel de leur secteur d'activité semble masquer leur encouragement à une politique de reboisement à l'échelle locale.

[1]This paper is derived from Selby & Petäjistö (1995), originally published in *Sociologia Ruralis* XXXV:1, 1995, pp. 67-92.

Introduction

Field afforestation has long been employed in Finland as a policy instrument for reducing the area of agricultural land in an attempt to control agricultural over-production. The first legislation in this respect being introduced in 1967 and the first major field afforestation programme began two years later with the introduction of a field reservation, or set-aside programme (Selby 1974, 1980). Since then, field afforestation was been a permanent part of a suite of policy instruments for controlling and balancing agricultural production.

Many parallels exist between Finnish agricultural policy and that of the Common Agricultural Policy (CAP) of the European Union. The main difference has been Finland's commitment to 100% self-sufficiency in times of crisis. Since 1985, a set-aside scheme has existed in the E.U. (Council Regulation (EEC) 797/85 and 1096/88) which is very similar to the one introduced in Finland in 1969. Similarly, the afforestation of agricultural land has become part of E.U.'s agricultural and land use policy (e.g. Council Regulation (EEC) 2328/91).

Whereas in Finland, field afforestation has singularly been considered as a means of removing land from agricultural production, the European debate on field afforestation has not only concentrated on field afforestation as an instrument to counter agricultural over production, but also on field afforestation as a means for environmental amelioration, and as a means for rural socio-economic diversification.

After the introduction of grant-aid for field afforestation in 1969, there was an initial peak of activity which reached c.12 000 ha in 1972 (Figure 1). Field afforestation activity declined fairly quickly after the termination of the Field Reservation programme in 1974 to c. 2500 ha/year throughout most of the late 1970s and 1980s. The introduction of a field afforestation premium in the late 1980s was effectively neutralised by the introduction of a field clearance fee in 1987 (Selby 1990a&b). A temporary increase in the afforestation premium at the beginning of the 1990s gave rise to a peak of activity which reached c.17 000 ha in 1992, only to fall to a predicted 5 000 ha in 1994 with the premium's suspension. Finland's membership of the E.U. has led to a new field afforestation programme which has yet to demonstrate its sustainability.

Resistance to field afforestation has also been found in Central Europe. Indeed, tacit recognition of this resistance is contained in Council Regulation (EEC) No. 2080/92 Instituting a Community aid scheme for forestry measures in agriculture:

> "experience in the afforestation of agricultural land by farmers shows that existing aid schemes for promoting afforestation are insufficient, whereas afforestation of agricultural land withdrawn from agricultural production in recent years has proved unsatisfactory".

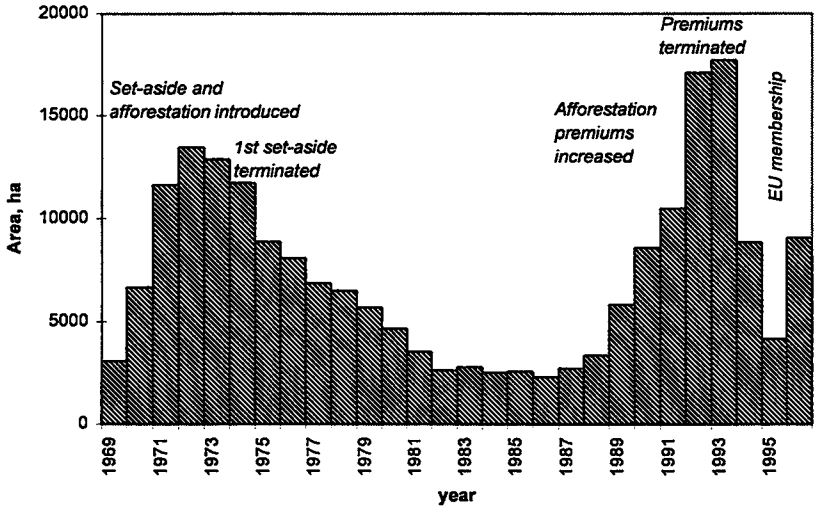

Figure 1: Variations in field afforestation activities, 1969 -1996

In Central Europe, social economic aspects of field afforestation have largely been considered in the context of job creation - as reflected in European Union regulations (e.g. Council Regulation No.1610/89 and No.2080/92) which address the development of farm and rural community woodland schemes (e.g Gardiner 1993, see also Thoroe 1993, Whiteman 1993). In Scandinavian countries, in which a high percentage of the land area is already under forests, the approach to field afforestation has been rather different. While economic assessments of field afforestation have been made (e.g. Aarnio & Rantala 1994), the important difference between Scandinavian and Central European field afforestation activities remains - namely that in Central Europe field afforestation is clearly linked to rural diversification, in Scandinavia field afforestation symbolises the loss of rural vitality and the termination of agricultural (Selby 1974, 1980, Mustonen 1990).

In a Central European context, Volz (1993, p.5) points out that the cessation of agricultural cultivation does not inevitably lead to field afforestation. Afforestation activities must be motivated by specific policy instruments. In Scandinavia, the close proximity of climatic climax forests assures the colonisation of fields by pioneer tree species quite independently of policy means to encourage field afforestation (Selby 1997). However, because of many farmers' negative attitudes towards field afforestation by grant-aided seeding and planting, the need for strong economic preconditions for field afforestation are seen to be essential.

The limited success of the policy of grant-aided field afforestation, in Finland has been examined in the context of some behavioural assumptions which are assumed to affect afforestation decision making by both farmers and the advisors who are the *de facto* administrators of policy. These assumptions concern the bounded rationality of both farmers and advisors within their taken-for-granted worlds of place and space (e.g. Selby 1980a&b, Mustonen 1990, Selby & Petäjistö 1994, 1995).

The present paper addresses on aspect of the field afforestation decision making process: namely, to what extent the sense of place and space, as behavioural concepts, play a role in the resistance to field afforestation in Finland.

First, there is a theoretical discussion outlining the concepts of place and space in the formation of attitudes, an experimental analysis based on empirical material is then presented. The empirical results appear to lend support to the hypothesis that ties-to-place and social space both lead to a local resistance in the willingness to afforest fields.

1. Social and personal space a source of objections to field afforestation

1.1 The individual and society

The initial assumption is that both farmers and advisors behave in a boundedly rational way. That is, individuals act in an intendedly rational way with respect to their perceived world, a world based on imperfect information and imperfect ability to use information (Brinkmann 1935, Simon 1957, Wolpert 1964, Pred 1967, Earl 1983). Further, rational decision making is considered to be restricted by personal aspirations (motivation) and the principal of satisficing, which limits personal aspirations to personally satisfactory levels of achievement, especially under conditions of bounded rationality (Simon 1957).

These behavioural attributes are assumed to apply equally to both farmers and the advisors (who are representatives of the corporate interests of the state).

Because farmers and advisors work in essentially the same socio-economic and cultural environment, the system is assumed to be in a state of *dialectic reproduction* (e.g. Gregory 1981, Berger & Luckmann 1966, and Ley & Samuels 1978). This creates a situation in which "reality is a social construction...that acts back upon is subjects, sometimes in ways that remain unseen and *taken for granted*" (Ley & Samuels 1978;12), while Duncan (1978) argues that man produces a world both of abstraction - that is, ideas values, norms of conduct - and of real concrete objects, which, although they are his own product, he nevertheless permits to dominate him as objective, unchanging (truths)". Similarly, Ley

(1977;504-505) notes that meanings (e.g. the meanings of social constructs) are rarely private, and they are shared and reinforced in peer group actions. Thus, while the individual plays a creative role in forming the society in which he lives, the *dialectic process* creates a feedback to which the individual is not immune. Thus, (following Ley, *ibid.*.), "each individual has a history and a geography which imposes constrains within his life-world, so begins the dialectic between creativity and determinism, charisma and institution, a dialectic which for the geographer becomes that between man and place." This is an important contention with respect to the question of field afforestation, as the *field as an entity* has been created, often in recent history. It has become an *institution* central to the dialectic between farmer and place, as well as a *metaphor* of rural continuity. It is also a part of the language of the trialectic between farmer, advisor and policy maker.

1.2 Constraints upon action in everyday life

Forces internal to the life-world of the individual and his/her group often act as considerable constraints. These, according to Ley (*ibid*;505), concern "the process of group consolidation, its collective view of the world becomes more telling on the individual, as he becomes successively more 'included' in it. So, too, his action becomes identified with group norms...The phenomenological model of man is one of a life-world with a group-centred reality".

Thus, by implication, cultural background plays a significant role in determining the life philosophies and value systems of individuals (whether farmer or advisor). These create psychological needs in the individual, which he/she attempts to satisfy. The individual's awareness of these needs is prompted by the cultural environment. Thus, changes in the environment which challenge these value systems, and which threaten to compromise the individual's needs, will be met with fear and hostility. Just as the Finnish set-aside programme met with hostility during the early 1970s (Selby 1974), so fear of change underlie the current resistance to field afforestation. Similar fear and stress situations are reported throughout Europe as farmers learn to cope with environmental constraints which often contradict their traditional value systems - the received wisdom as to what "good farming" is all about (e.g. Scerrat & Dent 1994).

1.3 Space and place

Because of the cultural environmental processes contained in dialectic reproduction, the concepts of *space* and *place* are considered to play a significant role with respect to farmers' and advisors' decision making with respect to field afforestation. *Social space* is seen as the **institutional construct of reality**, whereas *personal space* is seen as the **personal construct of reality** and is referred to as *place*.

According to Lefebvre (1991;33), ***social space*** is a space which 'incorporates' social actions, the actions of subjects both individual and collective. *Social space* is seen as a language, imbued with social values. But, by containing values social space also contains power-relations. The agricultural cultural landscape, for example, is symbolic of a particular society *and its reproduction*. This practico-social space (landscape) is a language embodying many of the values of that society. The extent to which this space can be treated as a message is defined by the way society or individuals read this message, and in the case of the rural landscape it hardly needs to be stated that it is a symbol which is almost universally understood. This is often reflected in contingent valuation studies of agricultural landscapes (e.g. Drake 1987, Willis & Garrod 1991). Thus, spaces and their language are produced, and form a language of the power structures of society (e.g. Pred 1984;280 and Cloke & Goodwin 1993). Lefebvre (1991;84) presents a similar argument, recognising that the "raw materials" of space are taken from nature, but these raw materials are the products economic and technical activities and that they are consequently political and strategic spaces. Space is argued to depend upon social superstructures. Thus, each of the institutions of the state calls for space - space which can be organised according to their specific requirements (*ibid*;85).

Field afforestation not only changes space relationships, it also alters the productive structure and "feel" of rural areas. With this in mind, Lefebvre's arguments that the social space of institutions is "inherent to property relationships (especially the ownership of the earth, i.e. land) and also closely bound up with the forces of production (which impose a form on that earth or land)" (*Op cit*;104.) become indisputable . Thus by way of this production, *space acquires a political economy*, representing the *power relations* contained therein. This gives reason to suspect that the policy of field afforestation is unlikely to be very successful. The argument for this being that the vested interests of the agricultural institutions will resist field afforestation. This resistance being manifested via reluctance, at the local level, to seriously advance field afforestation via the well developed agricultural advisory system.

The field also has a symbolic value, especially to the farmer, as the field is a metaphor for the creativity and socio-economic sustainability of the countryside. This symbolic value is derived from the historical process of settlement and "pioneering" land for cultivation - a process of recent history in Finland. It can therefore be contended that this symbolic value, acting through the psychological mechanism of *ties to place*, may be a significant factor in both farmers' and advisors' resistance to field afforestation. Arguments relevant to the present problem have been presented by e.g. Tuan (1974), Relph (1981) and Pred (1984).

Tuan (1974;213) notes that *place* has more substance than the locational aspect of the term suggests. "It is a unique entity, a 'special ensemble'; it has a history and meaning. Place incarnates the experiences and aspirations of a people. Place is not only a fact to be explained in the broader frame of space, but it is also a reality

to be clarified and understood from the perspectives of the people who have given it meaning." Tuan (1974;233-245) argues that the personality of a place arises when people, in describing a place special to them, use expressions which carry a greater emotional charge than merely locational or functional terms. Thus, "the personality of place is a composite of natural endowment (the physique of the land) and the modifications wrought by successive generations of human beings" (*ibid;*234).

Relph (1981;168-175) also argues that the individuality of place is not self-created, it is accorded. The individual distinctiveness of a place lies not so much in its exact physical forms and arrangements as in the meanings accorded to it by a community of concerned people, and the continuity of these meanings from generation to generation. Similarly, Pred (1984;280) placing this process in a structurist epistemology, regards *becoming places* to be an historically contingent process conceptualised in terms of an unbroken flow of local events.

It does not require a great deal of imagination to see how the above discussion applies to the problem of field afforestation. The creation of the agricultural landscape, particularly at the local level, has been a dynamic historical process affecting the whole community. Field afforestation would seem to sever this historical process. Consequently, the intrinsic value of fields should not be under estimated when considering the interaction of people, policies and land use in the context of rural vitality.

The issues of place and space are therefore seen to underpin the whole question of radical land use policy changes which effect the reproduction of vital rural social and economic structures. The temporary or permanent removal of fields provides such a case. It is not difficult to see that policies aimed at land use change, (set-aside, the afforestation of agricultural land, or even larger-scale afforestation programmes), lead to activities which change or effectively destroy shared, stable places with their own individualities. Consequently, such policies are likely to be met with resistance in the effected community.

An individual's decision to afforest fields has repercussions which effect the whole matrix of *place relationships* within the community.

2. Material and methods

The material for the present paper formed part of a wider investigation concerning field afforestation activities in Finland (Petäjistö *et al.* 1993, Selby & Petäjistö 1994, Petäjistö & Selby 1994a & b). Based on a sample of communes representing the major communal types in Finland (Varmala 1987), a systematic sample of the farmers was made from the national register of farms. From the selected communes in Southern Finland every sixth farm was selected from the farm

register, and every third farm in the communes selected in Northern Finland. The higher sampling rate for Northern Finland was based on the knowledge that the proportion of active farms are far less in that region (Petäjistö *et al.* 1993). The farmers were sent a postal questionnaire in Spring 1992 and the advisory officers in Spring 1993. The advisory officers in question were the selected communes' agricultural and commercial advisory officers, and the managing directors of the communes' forestry management associations. The response rate for the farmers was 65%, and for the advisors over 90%. Over 60% of the advisors were from either the same commune by whom they were employed or from the neighbouring commune. Further, 36% of the advisory officers owned forests in the commune in which they worked and 29% also owned farmland.

The 441 farmers and 28 advisors represented in the present paper were located in 11 communes in the southern half of Finland. Results for Northern Finland reveal a different set of primary sector processes because of strong environmental constraints on agriculture and forestry. and different socio-economic history (Petäjistö & Selby 1994).

Tabulation and correlation techniques provided the basis for examining the behaviour of specific pairs of attributes, while multivariate analyses, mainly principal components and discriminant analyses, were used for more detailed analyses (Selby & Petäjistö 1994). These methods enabled relationships between groups of variables to be examined with due reference to theory, but also enabled intuitive interpretation. Principal component analysis has the advantage of maximising the differences between components and due to their orthogonal form, correlations between components remain close to zero.

The disadvantage of principal components compared with factor analysis is that the error term is included and its effect on the component scores is indeterminable. The component scores, once computed, become "compound" variables which can be correlated and tabulated against original "prime" variables in further analyses. The ability of principal component analysis to extract the maximum variance from the data set is exploited in the experimental part of this paper.

3. Ties-to-place - farmers' values and field afforestation

Farmers' attitudes and values were examined and related to their objections to field afforestation. (Selby & Petäjistö 1994). To identify the so-called "basic dimensions" or groups of inter-correlated variables within the data matrix, the original variables (derived from the questionnaire) were entered into principal components analysis.

Contention	Rotated component loading			
	Val1	**Val2**	**Val3**	**Val4**
"I consider my fields to be part of my family heritage".	0.73	-0.13	0.10	0.10
"Agriculture and environmental management are the same thing".	0.70	0.05	-0.01	0.16
"My fields present to my heirs links to their family roots".	0.70	-0.16	0.13	0.12
"The agricultural landscape is central to our cultural heritage".	0.62	0.14	-0.08	0.11
"Modern agriculture is too intensive".	-0.06	0.75	0.11	0.02
"The demands of agricultural production can be compromised for the benefit of nature conservation".	0.02	0.74	-0.12	0.05
"The receipt of state aid limits landowners' ownership rights and independence".	0.01	0.13	0.67	0.09
"Agricultural and environmental policy should not be mixed together".	0.09	-0.34	0.60	0.09
"Agriculture should be made to compete freely, just as any other enterprise".	-0.01	0.37	0.53	-0.45
"Family farming should be supported, even though this means higher food prices."	0.18	0.01	-0.02	0.82
"Family-farming is more important than food production efficiency".	0.29	0.32	0.12	0.70
"Today, there is too much talk about overproduction".	0.15	-0.19	0.41	0.51
Variance explained, %	17.13	13.14	11.04	14.20
Eigenvalues	2.74	1.58	1.27	1.08

Table 1: Rotated Varimax principal component model of farmers' values

Farmers values were described by four well defined components (Table 1) which can be interpreted as follows:

VAL1 (*Traditional, home-orient values*) is characterised by strong loadings of variables concerning family heritage and a link to future generations. Agricultural landscapes and environmental values also received strong loading. Family farming values are less strongly but nevertheless positively loaded onto the component.

VAL2 (*Ecological farming values*) stresses the importance of extensification of agricultural production for ecological reasons, while farmers are clearly seen to understand that ecological issues and agricultural policy are strong related (the

opposite contention receving a fairly strong negative loading).. Interestingly, the component also includes free-enterprise values, as well as family farming values.

VAL3 (*Free enterprise values*) stresses the independence of the farmer from state aid. Agricultural and environmental policies are seen as separate entities, and the concept over production is not supported. Free enterprise would seem to be the message, with a touch of protest?

VAL4 (*Protectionist values*). The protectionists object to any discussion of over production and unequivocally reject free enterprise and change. Family farming is seen as a key value. This component differs from the *Traditional, home oriented values-* component in that while both support family farming, farmers holding traditional values nonetheless positively accept stewardship and environmental management as elements of change, whereas protections reject change.

Preconditions & Objections	Value component			
	Val1	Val2	Val3	Val4
Preconditions				
Decreased agricultural support	-0.11*	0.21***	-0.06	-0.08*
Afforestation premium paid as lump sum	-0.13**	0.23***	-0.02	-0.12**
Short-rotation forestry	-0.01	0.13**	-0.07	-0.12**
Objection components				
Emotional objections	0.27***	-0.04	0.14***	0.08*
Tenure change preference	-0.03	0.02	0.13**	-0.02
Security of income (active farming) objection	0.21***	-0.25***	-0.02	0.22***

Table 2: Farmers' values in relation to preconditions for and objections to field afforestation

***p=0.001 or less; **p=0.002-0.01; *p=0.02-0.10

Where:

Val1 - Traditional, home-area oriented values

Val2- Environmentally sensitive farming values

Val3- Free enterprise values

Val4- Protectionist values

Preconditions for and objections to field afforestation are here described by prime, or original variables. However, their selection is based on a wider analysis in which some eight objections to field afforestation were subjected to principal components analysis. The scores of the three components derived are employed in the correlation analysis shown here (Table 2).

Objections to field afforestation are positively correlated with most value types, with the exception of ecological farming values. Farmers in this group tended to reject the objections and accept the preconditions for field afforestation. Ecological farming values are also found to be associated with farmers who are otherwise

planning to reduce or cease their agricultural production, and this is further reflected in their positive plans to afforest fields in the next five years.

The strength and clarity of the component concerning *tradition, home-oriented values* in the value-model exceeded expectations, and the temptation arose to subject aspects of this component to further investigation. A time dimension was added by means of variables describing the intrinsic value given to field ownership with respect to the past, present and future. The time element was further supported in the analysis by including the number of years the farm had been in the same family (maximum 455 years, mean 87 years, median 70 years). Two dimensions were obtained irrespective of the time perspective employed (past-present, present or present-future). They were i) *Family farming and the intrinsic value of place* (PP1 & PF1), and ii) *Field ownership as family heritage* (PP2 & PF2), the interpretation being strongly influenced by the behaviour of the variable describing the number of years the farm had been in the same family (Table 3).

Time-related intrinsic value models				
	Past-present model		*Present-future model*	
Value contentions	**PP1**	**PP2**	**PF1**	**PF2**
"My fields represent part of my family's heritage (Past)"	0.48	0.70	*Not included*	
"My fields are my heirs' links to their family roots" (Future)	*Not included*		0.79	0.25
"Ownership of fields has value in itself" (Present)	0.64	0.45	0.80	0.18
"Family farming is more important than production efficiency" (Present-future)	0.77	0.16	0.60	0.45
Number of years the farm has been in the same family (Past-future)	0.20	0.82	0.10	0.86
"The agricultural landscape is central to the cultural tradition" (Past-future)	0.63	0.07	0.56	0.15
Variance explained, %	33.16	27.99	39.04	21.33
Eigenvalues	1.93	1.12	1.96	1.06

Table 3: Tentative models of the intrinsic value of field ownership

PP1 & PF1 - Intrinsic value of field as place

PP2 & PF2 - Field ownership as heritage

The structure of the component-pair in each time perspective are very similar, as expected. The nature of the first component in each pair (**Intrinsic value of field as place**) is determined by the high loadings of "*Ownership of fields has value in itself*" and "*Family farming is more important...*" The second component (**Field ownership as heritage**) is characterised by *length of ownership.*

Interesting deviations between the past-present and present-future pairs nevertheless occur. The statement "*My fields represent part of my family's heritage*" is loaded on the past-present component **Field ownership as heritage** (PP2), where as its counterpart in the future mode ("*My fields are my heirs' links to their*

family roots") is loaded onto the **Intrinsic value of fields as place** - component (**PF1**). The statement *"Ownership of fields has value in itself"* is fairly strongly loaded onto both the past-present components (PP1 and PF1). This statement is "complex" in the case of the past-present principal components solution, as it is loaded fairly strongly on both components. In the present-future mode it is only weakly loaded onto the **Field ownership as heritage**-component. The result suggests that the intrinsic value of field ownership is acquired via is present value (presumably with economic implications), while the heritage value of field ownership increases with the length of time the field has been in the family.

The association of "place" with the components PP1 and PF1 is derived (somewhat intuitively) from the strong loadings of landscape values and family farming values on these components. The landscape element is essential to identify of place, while the family farming element is also place-oriented, the family farm being a creation in time and place of a specific "place-creating" process.

	Time related intrinsic value models			
	Past-present		*Present-future*	
	PP1	**PP2**	**PF1**	**PF2**
Preconditions:				
Decreased agricultural support	-0.10	-0.06	-0.17**	-0.06
Increased afforestation support	-0.09*	-0.13**	-0.14**	-0.08
Short-rotation option	-0.08	-0.02	-0.09*	0.00
Objections:				
Emotional objections	0.25***	0.28***	0.34***	0.13**
Leasing preferred	0.08	0.02	0.08	-0.02
Good fields objection	0.28***	0.12**	0.30***	-0.02

Table 4: Farmers' preconditions for and objections to field afforestation in relation to components concerning the intrinsic value of field ownership

***p=0.001 or less; **p=0.002-0.01; *p=0.02-0.10

To further examine the relationship between the components and the preconditions for and objection to field afforestation, the component scores where correlated with prime variables (Table 4). Prime variables are used rather than the scores of principal components (as in Table 2). This decision was taken in order to maximise

clarity, given that the experimental components and their scores are not as robust as they might be.

None of the- preconditions were found to correlate positively with the past-present or present-future component scores. Indeed, the present-future component **Intrinsic value of field as place** (PF1) correlated strongly and negatively with both financial preconditions for field afforestation and significantly even with the short-rotation plantation alternative. On the other hand, emotional objections to field afforestation correlated very strongly and positively with all four components. "Good fields" - an economic objection - also correlated positively and strongly with the **Intrinsic value of field as place** components, and less strongly but still positively with the **Field ownership as heritage** component in the past-present mode. The leasing of fields to third parties failed to provide a clear result, being weakly correlated to the intrinsic value components.

4. Advisors and their attitudes to field afforestation - evidence for social space?

4.1 National level solutions

In the 1993 mailed inquiry, advisors were asked to express their opinions concerning a number of policy means for reducing the nation's agricultural over production problem. The questions were the same normative ones as put to farmers. The responses revealed different attitudes between different groups, but also some surprising similarities (Petäjistö *et al.* 1994b, Selby & Petäjistö 1995). For example total support was given to the propositions that *forestry should be made more profitable* and *agriculture should have an increased role in landscape management.* On the other hand, an increase in compulsory fallow did not generally receive support from agricultural advisors, but was accepted more readily by forestry and trade advisors. The result is not surprising, as compulsory fallow implies a reduction in the social space of the agricultural sector, i.e. land is taken out of production and out of the sphere of the agricultural advisors' decision making process - power relations are weakened.

The contraction of agriculturalists' social space is even stronger in the case of field afforestation, and as expected fewer agricultural advisors (66%) supported this solution that forestry advisors (90%), whose social space would be enhance by a greater forest area. In comparison, only 38% of farmers supported field afforestation. Nevertheless, it has to be remembered that the question concerned a principle for the country at large rather than a concrete policy for the home commune.

4.2 Local level solutions

In order to determine the effects of *ties to place*, the advisors were asked to consider the effectiveness of policy measures for reducing agricultural overproduction with respect to both the country at large and their home commune (Table 5).

There was a clear tendency for the effectiveness of agricultural production reduction measures in the home commune to be underestimated when compared to the country as a whole. Opinions were invariably many percentage points lower for the home commune than for the whole country. This was particularly the case for field afforestation - the most radical of the alternatives from the standpoint of continued agriculture.

	Ag.sec N=9		Trade sec N=8		For. ass N=11		Total N=28	
	NAT	HOME	NAT	HOME	NAT	HOME	NAT	HOME
Voluntary fallow	89	78	62	62	63	54	71	64
Compulsory fallow	89	67	62	62	82	73	79	68
Production reduction agreement	44	22	62	62	91	73	68	54
Field afforestation	***44***	***33***	***50***	***25***	***100***	***54***	***68***	***39***
Environmental farming	22	11	62	62	18	18	32	29

Table 5: Proportion of responders (%) who considered certain means for reducing agricultural overproduction to be effective in the country as a whole (NAT) and in their home commune (HOME), by professional groups

While over two thirds of the agricultural advisors supported field afforestation as a *policy principle* at the national level, less than half considered field afforestation to be an *effective policy*. Further, less than two fifths considered it to be an effective policy *for their home commune*. Similarly, almost all forestry advisors approved of field afforestation as a policy principle and as an effective means of production reduction for the country as a whole, but only 54% considered the solution to be effective in their home commune!

There is, therefore a strong indication that *ties-to-place* have a considerable effect on advisors' decision making with respect to field afforestation. As over half of the local advisors considered that they had considerable influence with farmers (Selby & Petäjistö 1994), the out come of their resistance to field afforestation in their local advisory work is likely to be significant.

Thus, resistance to field afforestation varies both with professional group and with respect to space and place. The result supports the discussion concerning the formation of "social space" in corporate society. Agronomists who "loose space" are more hostile to field afforestation than foresters who "gain space". Additionally, the measure is seen by all professional groups to be more significant for the country as a whole than for their home commune. The combined effect of "ties-to-place" and objections to a measure seen as "closing" part of local history are clearly discernible.

Conclusion

It has to be said at the outset that neither the material nor the method are ideal for the task of assessing the role of social space and ties-to-place in influencing farmers' and advisors' attitudes towards field afforestation. The reason for the inadequacy is the fact that the material was collected for an investigation the aim of which was to examine preconditions for and objections to field afforestation in a wider context than is now in question (Selby & Petäjistö 1994). Any subsequent investigation of the same problem should seek to obtain a deeper insight into farmers' and advisors' values by means of specifically designed personal interviews. For example, the use of the repertory grid approach. This approach is designed to elicit personal constructs from which the cognitive sets of individuals and groups can be determined by multivariate analysis (e.g. Kelly 1955, Harrison & Sarre 1971). The method is be ideal for assessing the social and psychological aspects of the formation of space and place values (e.g. Townsend 1977, Pomeroy *et al.* 1989).

Further, the material employed is not ideal for the task of addressing the emotional contents of the symbolism contained in the concepts of *place* and *ties-to-place*, a constraint that of necessity creates methodological limitations. The use of several analytical methods has sought to reduce this weakness by attempting to ascertain the structure and implication of basic dimensions in the data matrix while "keeping an eye" on the behaviour of original or prime variables in the analyses. Given the interpretative nature of the approach, and given the risks involved in multivariate analyses (e.g. Elffers 1980), a strong theoretical frame becomes an essential guide. While meaningful results are obtained from the analysis, there can be no doubt that the outcome is exploratory, mainly suggesting a path for further work.

That having been said, Selby & Petäjistö (1994) found that emotional objections to field afforestation were repeatedly represented in farmers' and advisors' objections to field afforestation. While the emotional and attitudinal attributes were expressed in somewhat general terms, and while few of them were highly significant as individual explainers of farmers' objections to field afforestation, they nevertheless formed basic dimensions which could not be ignored. The attempt to clarify some

underlying reasons for these emotional objections to field afforestation is largely outline in this paper.

Objections to field afforestation are held by most farmers who intend to maintain farming, while even farm diversification plans are not seen to greatly increase support for the preconditions for field afforestation (with the exception of short rotation forestry). Emotional objections to field afforestation were harboured by the majority of farmers in the sample, i.e. including passive farmers with no agricultural production. These objections were often found to overcome the often economically rational land use solution presented by the financial preconditions for field afforestation. On this basis alone, it would seem that even the recent levels of field afforestation in Finland will not be sustainable: a conclusion supported by the fact that the economic preconditions for field afforestation have deteriorated considerably since 1992 with the withdrawal of the afforestation premium (field afforestation in 1995 amount to only 4 100 ha) (see Figure 1).

Farmers' low propensity to afforest fields cannot be entirely divorced from the influence of advisory officers, especially as they considered that their influential powers to be strong. Advisory officers own lack of enthusiasm for certain agricultural over production restriction policies, and especially field afforestation, *in their own commune* can therefore be considered to influence farmers' decision making. This conclusion is supported by farmers' perceived advisory requirements which are particularly concerned with managing farm closures and shifts in production towards forestry (Selby & Petäjistö 1994, Mustonen 1993).

The question therefore arises, Are national land use policies administered objectively at the local level? The answer on the basis of this investigation would seem to be "Not necessarily". Indeed, we would argue that the attitudes of local advisors strongly suggest that *policy measures are only as effective as the efficiency of their lowest level of operation.* In this case, the lofty aim of the national level policy makers with respect to field afforestation (up to 20 000 ha per year within the national E.U.-funded field afforestation programme) does not seem to find support at the local level where the policy is administered. Further, it is quite clear that local advisors' motives for not advancing certain policy means, such as field afforestation, are embedded not only in their wish to maintain the social space of their sector of the corporate state, but also to preserve the cultural landscape, *their cultural landscape*, and other symbols and associations of their home commune which help to create and maintain their *ties-to-place*.

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Farmers and rural attitudes to forestry

Attitudes des agriculteurs et du monde rural à l'égard de la forêt

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Abstract: *Farm forestry in the Republic of Ireland is a relatively recent phenomenon. The author examines the evolution of the governement forest policy since 1881, and the related farmers attitudes. The lack of development in farm forestry up to 1980 could be explained by historical and financial reasons. The first scheme of EU funding for forestry, known as the Western Package was introduced in 1982 but had limited results. This situation changed in 1987 when the scheme for compensatory Allowances was launched. Then, the area under farm forestry has expended rapidly following the introduction of the Forestry Premium Scheme. Type of land planted, attitudes to forestry and management in farm woodlands are analyzed. If present trends in planting continues, farm forestry could become the major wood producer in Ireland, but much depends on farmers attitudes to managing their woodlands and the advice and training that they will received.*

Résumé : Le développement de la forêt paysanne est un phénomène récent dans la république d'Irlande. L'auteur examine l'évolution de la politique forestière depuis 1881, et les attitudes correspondantes des agriculteurs. Le faible développement de la forêt paysanne jusqu'en 1981 s'explique par des raisons historiques et financières. Le premier système de subventions européennes connu comme le "paquet de l'Ouest" a été mis en place en 1982, mais il a connu des résultats limités. Cette situation a évolué en 1987 avec le "Système d'aides compensatoires", puis les surfaces des forêts paysannes ont rapidement augmenté avec l'introduction du "Forestry premium scheme". Les types de terrains plantés, l'attitude des agriculteurs et la gestion des forêts paysannes sont analysés.

Si les tendances actuelles de plantation continuent, la forêt paysanne pourrait devenir une source prépondérante du bois dans la république d'Irlande. Cela dépendra néanmoins beaucoup de l'attitude des agriculteurs dans la gestion de leur forêt, ainsi que des conseils et de la formation qu'ils recevront.

Introduction

Farm forestry in the Republic of Ireland is a relatively recent phenomenon. Only since the introduction of substantial European Union funding in 1982 has the farming community in Ireland exhibited any real interest in forestry. Over the last seven years 6000 farmers (approximately 4% of the farming population) have planted 50,000 hectares (approximately 10% of the total forest area). The lack of development in farm forestry up to 1980 was largely influenced by farmers attitudes to forestry. This paper will examine these attitudes as well as the attitudes of rural people to forestry.

1. Developments in farm forestry between 1881 and 1981

Government forest policy in Ireland since the early part of this century was to expand the State forest area. As a result, large areas were planted by the State during the period 1920 to 1980. Much of this planting took place on the poorest of soils as government policy, which fixed a ceiling price for land that could be purchased for forestry, ensured that land fit for agriculture could not be bought for forestry. Private forestry received little if any Government attention during the early part of this period and private afforestation was negligible. While Government assistance was available from 1928 to those private individuals who wished to afforest part of their land, uptake of grants was largely limited to the owners of large land estates. Farmers remained uninterested.

The reasons for the lack of interest shown by the farming community in forestry during this period were historical and financial. Historically, it had been the owners of large estates who had planted trees for recreation and game purposes and to satisfy domestic timber needs. The peasant farmers who rented very small parts of these estates up to the end of the last century used their small parcels of land to supply their food needs. For many, the growing of these recreation forests seemed a waste of valuable land. With the passing of the Land Acts of 1881 and 1903 the estates were broken up and many of the trees on these estates were felled by the landlords prior to their leaving. The new owners, the former peasants, felled much of the remainder to maximise their agricultural area. Thus from an historical context forestry was perceived to be associated with the landed gentry and was not an enterprise that farmers were traditionally associated with. Indeed an antipathy towards forestry developed as a result of the small farmer "looking enviously across the walls of the estates at the recreation forests" (Gallagher 1991 p.76).

There were considerable financial barriers to farmer involvement in forestry. While State grant-aid towards the cost of establishing forests was made available to the private sector from 1928, the level of funding was quite low. Investing in forestry

would have required a farmer to commit himself to considerable financial outlay in establishing a forest as well as a possible reduction in agricultural income.

2. Farm forestry since 1981

The first scheme of EU funding for forestry in Ireland was introduced in 1982 as part of an overall package of grants for the less-favoured areas of the EU. The primary aims of this first tranche of funding were to raise farm incomes in these disadvantaged areas and to reduce the Union's deficit in wood. Under the provisions of this scheme (known as the Western Package scheme) farmers in western Ireland who wished to afforest part of their land could receive 85% of the costs of establishing these woodlands in the form of grant-aid while other private landowners could avail of lower grants. A key limitation was that only land considered marginal for agriculture was eligible for funding. While the level of financial assistance under this scheme was considerably greater than the funding heretofore made available, interest and uptake of the scheme was limited in the first five years of operation. The target set for this period was 6000 hectares, however only 631 hectares were planted.

Reasons for the lack of interest in the Western Package scheme have been explored. It was shown that the majority of the farm-holders in western Ireland were unmarried, old and had no children who were likely to continue in farming (Nugent, 1985). Thus the appeal of a long term investment, such as forestry, was limited. Furthermore traditional farming methods in the area targeted by the Western Package were prevalent and the elderly farmers living there were not very interested in change. Despite the general optimism about markets for forest products, the risk associated with a long-term investment discouraged many farmers. Most were very unfamiliar with aspects of forestry and would have benefited from some form of extension programme. Although advice was available from the Forest Service, farmers would have only approached these sources of information when they already had decided to plant their land.

The long term nature of the forestry investment made it particularly unattractive to farmers especially as no returns were produced for the first 15 to 17 years after plantation establishment. Farmers were familiar with receiving an annual income from their agricultural enterprises and the change to a forestry enterprise with its associated lack of income for the initial 15 years had a major impact on their attitudes. While comparisons between the gross margins from forestry and from certain farming enterprises showed that forestry could be more profitable, there was no means of converting the returns from forestry into an annual income. This situation changed in 1987 when the Scheme for Compensatory Allowances was launched. This scheme provided annual payments to farmers for the first 15 years in respect of land they had afforested. Specifically the scheme compensated

farmers for any reduction in stock numbers that they would have experienced from converting land to forestry.

While few satisfied the strict criteria for eligibility, nonetheless the Scheme for Compensatory Allowances was the first attempt to provide farmers with an annual income.

By 1990 the Forest Premium Scheme was launched which provided farmers (and indeed others, albeit at lower rates) with annual payments in respect of land they had afforested. Simultaneously establishment grants were increased. For the first time better quality land (i.e. land enclosed for agriculture) now received the highest rates and thus farmers were now being actively encouraged to plant the better parts of their holdings. This change in policy which emanated from the EU was an attempt to reduce the sizeable surpluses in agriculture within the Community (CEC, 1988).

The area under farm forestry has expanded rapidly following the introduction of the forestry premium scheme (as seen in Table 1). In 1991 for the first time private planting exceeded state planting and the farmer component of this private planting has continued to increase.

Year	State Planting	Private Planting	Farmer planting	Farmer (%)
1986	4689	2560	461	18
1987	5395	3213	771	24
1988	7122	5254	1839	35
1989	6625	8595	3868	45
1990	6670	9216	3963	43
1991	7855	11410	7981	70
1992	7565	9617	5385	56
1993	6827	9170	6779	74
1994	7000	12837	9122	71
1995	6487	17342	14675	85

Table 1: Afforestation rates 1986-1995 (ha)

3. Type of land planted

The fact that much of the new forest estate planted since independence in 1922 was located on mountainsides and in bogs, cultivated the perception in the minds of farmers and the general public that forestry was only suitable for the poorest of land. Not surprising therefore that much of the earlier planting (prior to 1990) undertaken by farmers was on poor quality land. Research has confirmed that most farmers who planted trees have done so on poor ground that was "good for nothing

else" and have essentially planted on "wasteland" (Kelleher, 1986; Ni Dhubhain and Gardiner, 1993). In fact many of those who have not afforested have similarly attributed their lack of involvement to scarcity of "bad land".

The average area planted in 1992 was 7 hectares with Sitka spruce the most common species planted. The increase in funding for better quality land has resulted in greater areas of this type of land being afforested. This has allowed a greater diversity of species to be planted. While the average area planted remains low at 10 hectares a greater proportion of new woodlands are composed of conifer/broadleaf mixes.

4. Attitudes to forestry

The recent increase in the area of good quality land being afforested has generated considerable conflict. The Government and the EU wish to see a reduction in agricultural surpluses as well as a greater species mix being planted. Both of these aims require that better quality land be planted. Farming organisations on the other hand wish that good land be sold to farmers for agriculture rather than allow it to be irretrievably lost to and wasted on forestry. Commonly, land is not sold at public auction and it can quite often happen that the first a farmer knows that a piece of land he wishes to purchase is sold is when the forestry establishment machines move in on the site. Even if a farmer gets to bid for land, it is now claimed that he can no longer compete with those wishing to purchase land to afforest given the high incentives that are presently available for forestry. As a result of farmers not being able to afford to buy land, forestry has been perceived as a "sinister depopulating agent, moving across the countryside and removing homesteads in its path" (Gallagher, 1991).

That forestry can contribute to rural depopulation is not a recent perception of forestry. It has its genesis in the early part of the 1980s. At that time the Western Package scheme had just been launched and while farmer uptake was limited, commercial institutions such as banks investing for pension funds availed of the grant-aid that was available. They purchased land in the west of Ireland and in many cases entire farms were sold and afforested. These institutions were generally based in Dublin and were seen to contribute little to the area in which they afforested. Feelings in some areas afforested ran so high that machinery used on these sites was mysteriously burned. The perception held among farmers and others in these areas that forestry forces people from the land is still as strong as ever. However, rural decline has been a feature of many parts of Ireland for over a century particularly areas in the west of Ireland. Forestry which was located on the poorest soils in this part of the country is unlikely to have had any impact on rural population levels.

One particular aspect regarding the design of forests that has received some negative comment is the sense of isolation that forests can generate. This impact has been highlighted by farming organisations. The Irish Creamery Milk Suppliers' Association (ICMSA) in one newspaper article (Anon., 1993), claimed that "afforestation is dividing rural communities.....the forests are creating barriers and neighbours can no longer see neighbour".

While neighbours in rural areas might live some considerable distance apart (and thus are already isolated) forests by their very size and height increase the sense of isolation in these areas.

In an effort to quantify whether the perceptions outlined above are shared by most rural landowners a survey of over 600 rural landowners was conducted in 1992 to investigate these issues. In this survey the landowners were asked whether they agreed that forestry lead to rural depopulation and isolation of farmhouses. Forty-eight per cent agreed with the first issue while 48% agreed with the latter (Ni Dhubhain and Gardiner, 1994). Other survey work has shown that rural people's attitudes to forestry are strongly influenced by the amount of forest in their area and how long the forests have been there. One such survey was conducted by the Economic and Social Research Council in two Irish counties. One county, i.e. Wicklow is located on the east coast and this has a 15% forest cover, much of which has been planted over the past 40 years. The second county, Mayo is a western county has a 9% forest cover most of which is only recently planted. The survey showed that almost 90% of respondents in Wicklow were in favour of forestry development while only 60% in Mayo were in favour. The overwhelming reason given in Wicklow by those in favour of forestry was that it gave employment while in Mayo respondents indicated that forestry provided a good way of using marginal land. The dominant reason by those opposed to forestry in Mayo was that it was inimical to agriculture and that it caused depopulation and isolation. (Kearney and O'Connor, 1993).

5. Management in farm woodlands

Farmers are now responsible for the majority of new forest planting in Ireland. These new farm forests are usually small (average area 11 hectares) and fragmented. Until recently many of these farm forests were planted with Sitka spruce on marginal agricultural land. Lately, with a move to better quality land, a greater range of conifer species, broadleaf species and mixtures are being planted.

Much of the work and management in these farm woodlands has been undertaken by private management companies. The usual procedure is for farmers to pay the grant to a management company who will undertake to establish the forest and manage it for 4 years. A recent survey has shown that only 20% of farmers who have planted since 1982 have carried out the work and management involved in

their woods (Wall, 1997). A further 34% employed management companies or contractors for some of the work and management. This contrasts sharply with countries which have a longer tradition of farm forestry. For example, in Sweden, forest owners are greatly involved in management of their forests (Holm, 1993). The main reasons given by Irish forest owners for using a management company is that they don't have enough time to do the work or they don't have enough knowledge (Wall, 1997).

Concerns have been expressed about the implications of this lack of involvement by forest owners in woodland management. The vast majority of management contracts expire after four years and a recent survey has shown that over 70% of farmers using management companies intend taking over the management and work themselves after the management contract expires (Wall, 1997). This is in spite of the fact that these landowners have little if any expertise or knowledge in forest management. While some training course are available for farmers, uptake has been limited and extension and advisory services are still only at a developmental stage.

What will make the task of management in these private woodlands more challenging is that many private forest owners wish to manage their forests for multiple purposes rather than singular. Among these multiple uses, the production of timber for sale remains the most popular (latter (Ni Dhubhain and Gardiner, 1994; Wall, 1997). If quality timber is to be produced from these woodlands, considerable work will need to be invested in them especially in broadleaf woodlands. Multiple-use management will present its own management challenges.

Efforts are now focusing on providing farmers with more information and in some instances training. In this way even if they never undertake any of the work in their woodlands they will be better equipped to judge the quality of the work being undertaken by companies and at that same time have some input into the decision-making regarding their woods.

Conclusion

Prior to 1980 most forests were located in relatively uninhabited regions in the west of Ireland. The rapid expansion of forestry since 1980 and the move onto better soils has exposed the rural population to forestry in an unprecedented fashion. This rapid and very obvious change in land use has contributed to the negative criticism of the way and the rate at which the forest estate is developing. Over time, as these forests become a more familiar part of the landscape, attitudes are likely to evolve.

In many European countries the private sector is the main supplier of wood to the forestry industry. In Ireland, if present trends in planting continues, the private sector, in particular farm forestry, could become the major wood producer in

Ireland. If however, this is to happen much depends on farmers attitudes to managing their woodlands and the advice and training that they receive. Fostering a knowledge and an appreciation of forestry practice should be encouraged so that it becomes part of the rural culture. This is particularly true in those communities engaged in substantial afforestation programmes where traditional land uses have not until now included forestry.

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Local based factors influencing attitudes on forestry in western norway

Based on a study of forest-owners and their households

Facteurs locaux influencant les attitudes sur la foresterie dans l'ouest de la Norvège ; une étude des propriétaires forestiers et de leurs ménages

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Abstract: *For the past two years we have been working on a project where we address forestry and forest activities in the context of regional development. Professor Jørgen Amdam leads the work and we have had close connections to The Norwegian Institute of Forestry Research (NISK) and the Norwegian School of Economics and Business Administration (NHH). The aim of the project is to identify factors that affect the forest-owner's propensity to cut timber. We have focused on factors that are connected to the forest-owner's household and the local communities. A qualitative study has been undertaken, where some 100 owners have been interviewed. We also have completed a questionnaire to a large part of the owners in general. Our findings support our thesis that local based factors are of importance and suggest that there is a need for further research. We also find that economic factors concerning forestry don't seem to be as dominant as one could expect. There also seems to be room for local organizations and local authorities to be more active. The main conclusion can be said to be "Different actions for different groups".*

Résumé : Pendant les deux dernières années, nous avons travaillé sur un projet relatif à la foresterie et les activités forestières dans le contexte du développement régional. Ce travail a été conduit par le professeur Jorgen Amdam et mené en collaboration étroite avec l'Institut norvégien de recherche forestière (NISK) et l'Ecole norvégienne d'économie et d'administration (NHH). Le but du projet est d'identifier les facteurs qui influent sur la propension des propriétaires forestiers à exploiter le bois. Nous nous sommes concentrés sur les facteurs liés au ménage du propriétaire et aux collectivités locales. Une enquête qualitative a été réalisée auprès d'une centaine de propriétaires.Un questionnaire a également été envoyé à un échantillon important de propriétaires. Les résultats confortent l'hypothèse que les facteurs locaux sont importants, mais qu'ils doivent être mieux investigués. Par contre les facteurs économiques propres à la forêt ne sont pas prépondérants contrairement à ce qu'on aurait pu attendre. Il semble aussi qu'une activité accrue des organisations et des autorités locales puisse avoir un rôle. La principale conclusion, c'est que les actions de développement doivent être adaptées en fonction des groupes sociaux.

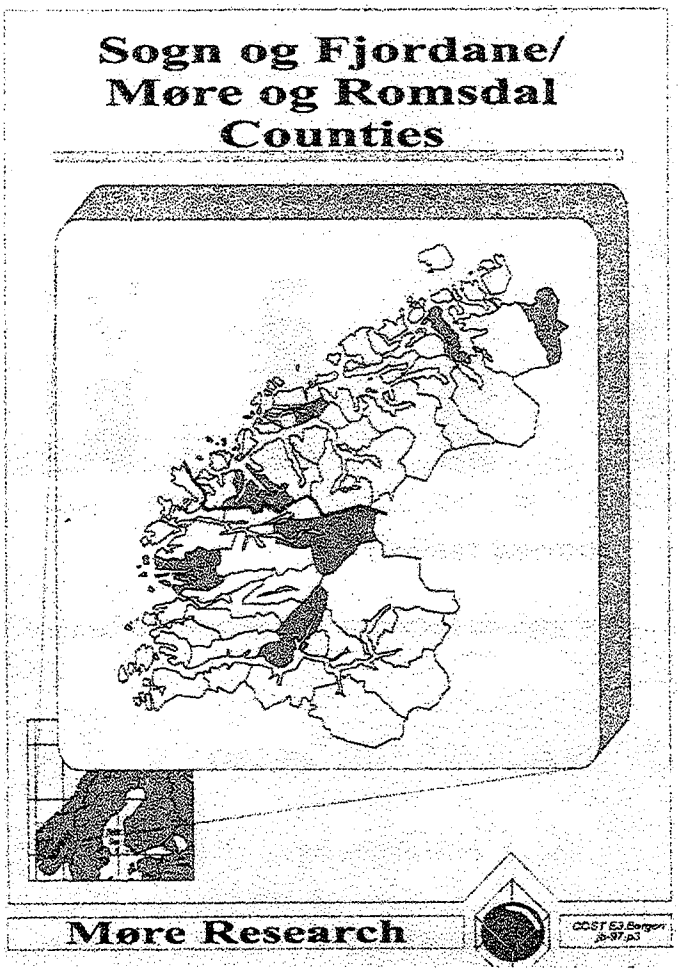

Figure 1: Map of the two counties with the case-municipalities marked out

1. The Project

At first, we were approached by governmental representatives on the regional level, in forestry that is, from our home County (see figure 1), saying:

The County is rapidly increasing its timber cutting potential as a direct result of planned planting and afforestation activities from after World War II. (As can be seen from figure 2, the potential resources will be almost doubled during the next 50 years or so.)

At the same time, the County experiences a dropping cutting activity (at the present both in relative and absolute numbers). Fewer people engage and the volume goes downward.

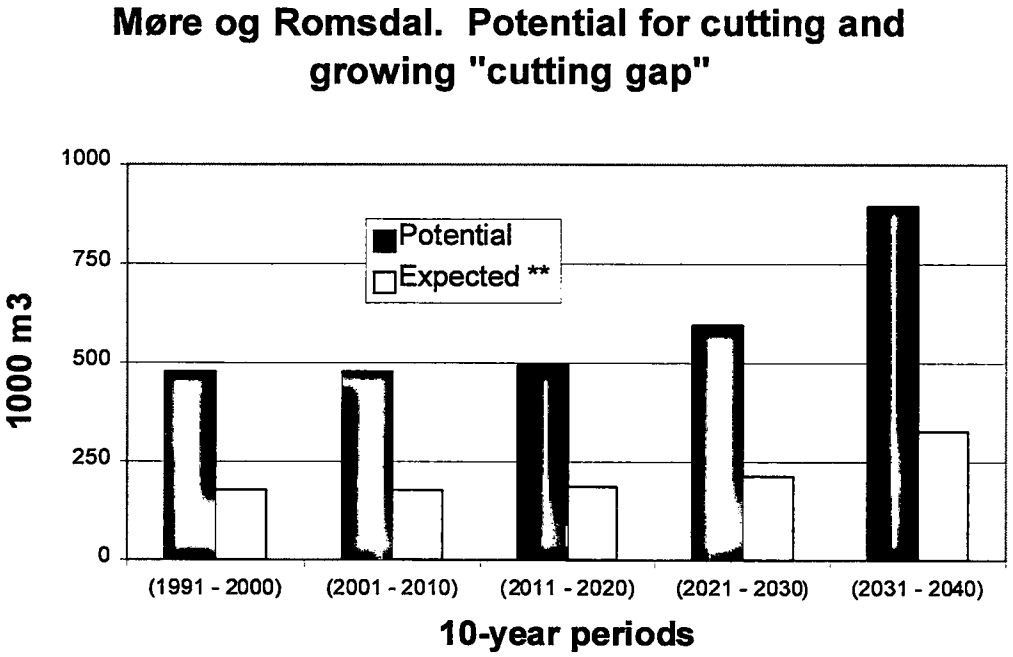

Figure 2: Estimate of resources and expected cutting levels, 1991 to 2040

The local industries – at least in parts of the County – are relatively big wood consumers (furniture manufacturers). But they use almost no local timber in their production. The given reason is that local timber quality is not suited, but one might argue that there in fact is more of a logistics- and organizational problem.

The situation in this County (Møre and Romsdal) is largely alike to the other Western Norwegian Counties.

Thus we were asked: Could you help us getting knowledge of:

1. factors affecting the cutting level and
2. factors that can help to promote the use of local timber in local production.

(Up to now, our main focus point has been on no. 1)

So we said "we'll try – but along the lines we know of. We'll not conduct Forestry Science, but use Social Sciences, focusing on factors that are local-based, and using what we have learned through working with local mobilization (the techniques, utilizing general results etc.).

We will give it a qualitative try, first by trying to identify hypothesizes fit for future testing out – both in a scientifically way, but also in terms of elaborating more direct actions.

2. Methodology – our approach to the problem

In our work we have concentrated on the groups we consider to be the main stakeholders :

– the Forest Owners. Being the ones who must make the final decision to cut – or not to cut.

– the Forest-Owners' Households. They are especially important since the decision to cut not only affects the owner, but also his household. E.g. in situations where time (or to be more specific – lack of time) is a critical factor, the household structure will be of importance and influate the decisions being made.

– the Local Community. From our work on local mobilization we have found the local community to be an important factor, especially on the sub-municipal level. Differences in local traditions, a local attitude towards forestry – and also towards engaging in different kinds of economic activities (e.g. a pro-active versus reactive community) - plays their roles here. We will put special emphasis on two sets of factors:

- the Local Organizations, either Forestry related or aiming towards other activities

- the Local Manufacturing and the Local Industries. Is there a "Spirit" to engage in economic activities (pro-active community), do they have historic traditions etc.?

– Governmental, Regional and Municipal authorities. They being the formal stakeholders and holders of the "formal keys" (grant schemes etc).

3. Methodology – how we did our work

Up to now, our project has consisted of two parts:

1. An introductory, qualitative study (1996) where we have interviewed some odd 100 forest-owners in Sogn og Fjordane and Møre og Romsdal. The main goal being to identify a set of factors of interest, and later trying to find their magnitude, covariance etc.

2. A broader questionnaire to some 15% of the forest-owners in Western Norway (1997). Still into the qualitative, but more to be able to weigh the different factors. This study is just being completed.

In the first part, we interviewed some 100 persons. Mostly male forest owners, but (in one area in particular) we also got the chance to include their wives. Ordinarily forestry was male dominated, but in this area women took active part in the outdoor work, as well as in discussions in our interview. We also interviewed representatives of regional and local forestry organizations and authorities.

Our techniques were qualitative, using a rough guide to make sure all topics of interest were covered. This gave much room to the respondents to focus on themes of their interest. As much as possible we tried to "let them do the talking", and only interferred in cases where the flow seemed to stop. The interviews were held at the owner's homes, lasting from 30 minutes up to for hours. They were taped, and the result was typed out and used for further analysis.

We used a technique of "strategic sampling" in picking the interviewees. We had two basic criteria (age between 20 and 67 and a privately owned forest area exceeding 1 ha). Then we used local informants to narrow down the number a bit (pick out different owners who ought to have special knowledge of local forestry conditions). This did not secure a representative sample, but as our goal was to search for factors rather than to measure them, we sought to get as much as possible with the least effort.

In this first part of the study, we only did a somewhat simple analysis of our material. More thorough analysis to come later.

We aimed at identifying the owners attitudes as well as what they actual were doing

– on their role as forest-owners, and the role of the household regarding forestry
– to forestry in general, both locally and on a regional/national level
– to the forestry organizations and the authorities officials
– on the community (e.g. "do you often talk about forestry when you meet other locals at informal meting points").

In the second part we have just concluded a questionnaire by mail to 15% of the registered forest owners in Western Norway. The questionnaire was sent early in March 1997, a simple reminder in late March and a more formal reminder in April. All in all we got reply from more than 50% in our sample, reaching a total of close to 1200 replies. The data have been processed for analysis, and the analysis will start in June 1997.

Our aim is to make use of the data, along with the data from phase 1 in the testing out of hyphotesises of different relations. In this paper we will just barely utilize some of the more obvious findings.

4. Some characteristics of the Western Norwegian Forestry

We will now briefly present some of our findings, basically based on phase 1 of our project.

– Predominantly Small-Farm Forestry

E.g. i Møre og Romsdal County we found the average forest size to be some 3,5 ha, the median value being even lower (around 2 ha). The forests are privately owned. They usually have been in same family for generations. There is almost no buying and selling of forestland.

Much of the forestland is relatively newly afforested. This meant that large areas have had little time to acquire the skills and traditions for forestry.

– Forestry – as is also often the fact with farming – very often does not make up the whole of – or even the major part of – the households' income.

Our study shows that forestry – on the average – could be said to contribute less than 5 % of the households' income. As with forest area, the median is lower. This means that "pluractivity" is the case. We could list it thus (omitting housekeeping as it generates no direct income):

– the Owner:
no.1: **Farming** (milk and beef), no.2: Off-farm work, ..., no.3 - 5: *Forestry*

– the other household members:
no.1: Off-farm work, no.2: *Helping on-farm, with forestry being close to zero.*

– Generally few employment related problems (at present)

Regarding forestry, one could state the problem as being too little unemployment. We generally tend to find a connection between low forestry activities and low rate of unemployment/ broad employment possibilities.

– The importance of Local Forestry-Related Organizations

We found generally strong linkage between active local organizations and high cutting activities.

Even though this doesn't necessarily mean that one comes from the other, it suggests that the organization will be a good place to put the effort when executing different actions.

We also found local organizations to be very reliant on attitudes of single persons. Often one engaged person alone could make up the difference between an active and a passive organization. Thus it will be important to take care, not to let these "burn out"

– Local traditions connected to forestry

This affected in two ways. First that areas with historic timber traditions had the more know-how and skills. Second that the local traditions for what to do with the timber differed. We had passive areas, selling it straight out and active areas using it in different kinds of local productions (boat building, fish-boxes, casks etc.)

5. Using our study as a basis for actions

Part of the intentions with the project was to make a contribution towards the regional authorities in the making of a new policy towards forestry in Western Norway. In this respect we felt our approach to be a good way of getting a view of the complexity the problem raised. We found that the forest-owners decision to cut – or not – was influenced by a large number of factors from a very broad range. Not having spoken about prices up to now is deliberate. In thinking about actions, we generally found that even though prices vere mentioned as important, the general impression was that other factors both were as important – and also more easy to influence.

Also, we did not set out to find "the Answer", but more like getting glimpses of the different strategies needed to cope with what we found to be the different "groups" we could identify.

Thus we came along to what we considered to be an appropriate "sorting" of the forest owners into different groups related to activity and potential for activity.

To us, this was an important case. The goal being to come up with suggestions for "what to do to better the situation" (where better meant more timber cutting), we right from the start had an impression of the need to differentiate, to develop different actions for different groups.

We have had many examples of official actions with too broad a scope, which doesn't reach to do what they set out to do. Also there is general knowledge of the need to "tailor to needs"; Aggregating and using national/regional measuring often confuses the real problems, characteristics etc. and makes it difficult to hit the right spot.

We conducted our study at the micro level (individual level), gaining knowledge of the attitudes and actions of the single individuals. To us it was obvious that such an individual-oriented approach also would be right in elaborating actions.

This made us end up with a basic set of four forest-owner categories.

Conclusions

Methodology

The use of techniques from Social Science when addressing forestry has not been widely used up to now. Focusing on the forest owner/his household and local-based factors has proved to be an interesting approach and has gained us new insight. We also have evolved a fairly robust methodology that has proven to be effective. In this way we managed to get a lot of information on the opinions of the people who are the main stakeholders; the owners and their families.

Preliminary findings

Perhaps one could conclude that money is not the (only) solution. Knowing how a market-economy works, it is evident that ordinary means e.g. price-changes will not affect the cutting propensity very much (when looking at the rather small chances one could induce). Forest owners have reported to cut the same amount of timber regardless of price fluctuations. The ones, who do not cut, generally report that it is not directly caused by low prices.

Lack of time could be mentioned as an important factor, especially amongst forest-owners with small children. They have found a way to adapt where forestry has (almost) no room. If forestry shall prevail, it generally will affect their free-time/time spent with family.

Also important is a generally high employment. The area as a whole has an unemployment of about 3%. None of the ones we interviewed reported to be unemployed. Also salaries are generally high. Thus there seemed to be very little demand for extra money from forestry.

We have divided the forest-owners into four groups. In short, this could be a characteristic of the typical group member:

The Commercially Active

Income from forestry comprises a relatively large part of the household's income. The household is active towards the forest, both commercially and otherwise. Generally intensive forestry in combination with less intensive farming (raising cattle for beef-production) and often combination with different off-farm occupations. The

forest area generally is large (as is large in our sample). Most important seem to be their interest in forestry and its different aspects. The interest permeates the household, there has generally been forestry in several generations. A local community where forestry is significant also goes along with the group.

The Forest Active

What separates this household-group from the one above is that it does not take part in the commercial side of forestry. They generally show interest for forestry, keep their forest in good shape and care about what is to be done with it. The main hindrance seems to be lack of tradition and resulting of their current household adaptation.

Their forests are generally not as large as in the former group, and we often find them intensely engaged in farming (milk-production tends to dominate).

We've got the impression that many of them can become commercially active when their spruce gets ripe (during the next 5 to 20 years), given that they can be properly motivated. This places a great responsibility on local and regional forest authorities in cooperation with local forest-owners organizations.

They also lack the knowledge of how to act in the commercial system. And many feel that they, as small-scale foresters, are not taken seriously, the system seems to be more interested in dealing with the few relatively large owners.

The passive with potential

In this group we find many active farmers. What separates them from the former group(s) is firstly their lack of interest in forestry. The forest is a "problem", they haven't got time to tend to it, and are generally more interested in farming. Thus we are facing a higher threshold for personal engagement in forestry. We've found that cooperation between the owners can be a means. Forest contractors are generally seen as a problem and not widely used – if they're not local based and one "knows them" personally. There is also a need for the households to change their adaptation to make room for forestry in their time-schedules.

The passive without personal potential

They generally have small forests and little knowledge of forestry, but are by and large a fairly inconsistent group. The early pensioners, the off-farm working, and the off-farm dwellers are three important subgroups.

But they still – as a group – control fairly large recourses in a community, and it would be of interest to put their forests in use. We mostly found that there is little personal potential for activities. What could work, could be for the local

organizations and authorities to engage and take responsibility also for the felling of the trees. We've been looking into models from farming, e.g long time tenancy of the forests.

From this grouping we can see that factors connected to the households and factors connected to the local settings are of importance when forest activities are planned. We also have found thar there is room for actions from the forest authorities and the forest organizations. Our main conclusion has become "Different actions for different groups". Up to now there generally has been little effort to separate into groups and designate specific actions towards the different groups.

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Integrating amenities and liquidity constraint into afforestation decision-making by private property owners: a dual approach

L'intégration des valeurs non marchandes et des contraintes de liquidité dans les décisions de boisement des propriétaires privés : une approche duale

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Abstract: *A greater land potential for afforestation might now be expected because of set-aside common policy, agricultural population decline and increased public concern for the landscape and environment quality.Currently, the main trend (in France) is the change in land-use from agricultural land to fallowland. In order to better catch the economic basis of afforestation processes, it might be worthwhile to set landowner's decision-making in a theoretical framework. We first present several arguments related to the intertemporal aspect of the decision to afforest, and to liquidity constraint and uncertainty as well.These factors lead to emphasize the role of the owner's current budget constraint (and consequently, those of afforestation expenditures). We set an objective function over the lifecycle (lifecycle utility) by integrating amenities from forest surface areas. Integrating the latter is coherent with environmental welfare economics and empirical observatins as well. In the third part of our paper, we turn to a dual treatment of the afforestation decision. This involves discrete choices, since amenities from private forest are not essential goods. In this context, a expenditure thresshold arises from the maximisation of a current utility function. Keeping utility level constant, we can define the unconditional expenditure function. this latter is discontinuous in terms of the unit cost to afforest land. The thresshold for afforestation cost is endogenous and specific to each owner. So, for observer or policy maker, it appears as a random variable, distributed according to a parametric statistical distribution law. This discrete, dual setting has econometric and policy consequences. As a conclusion, we stress the rent producing role of a lump-sum aid.*

Key-words: *Life cycle models, expenditure function, liquidity constraint, forest policy*

Résumé : Les critères habituels d'évaluation des investissements forestiers apparaissent inadéquats pour comprendre les décisions de boisement des terres par les ménages agricoles. L'existence de contraintes de liquidité intergénérationelle ou dans le cycle de vie, l'absence de marché pour les parcelles forestières, l'incertitude sur le marché du bois, amènent à considérer des modèles de décision dans lesquels les aménités procurées par la forêt ou les systèmes agro-forestiers sont importantes. Dans ce contexte, les surfaces boisées peuvent avoir une valeur patrimoniale subjective, et la rationalité du comportement consiste à minimiser la dépense pour une utilité donnée. Ceci implique des choix discrets, dans la mesure où les aménités des forêts privés ne sont pas des biens essentiels pour leurs propriétaires. Dans ce contexte, un seuil de dépense résulte de la maximisation de la fonction courante d'utilité. Le seuil pour le coût de boisement est endogène et propre à chaque propriétaire. Par conséquent, pour l'observateur ou le décideur politique, il apparaît comme une variable aléatoire, distribuée selon une loi statistique donnée. Ce modèle discret et dual a des conséquences en terme d'économétrie et de politique publique. En conclusion, nous soulignons les effets redistributifs de subventions forfaitaires.

Mots-clés : *Modèle de cycle de vie, fonction de consommation, contraintes de liquidité, politiques forestières.*

Introduction

Two arguments can be used to justify studying the economics of an owner's decision to afforest agricultural or abandoned land: the set-aside measures of the CAP and the reduction of agricultural lands following rural depopulation. In such a context, there is a potential land disponibility for new demand and land uses, from public and private owners as well. Usually, the switch from agricultural land to forest (Figure 1) comes about naturally, through the development of natural regeneration on abandoned land[1].

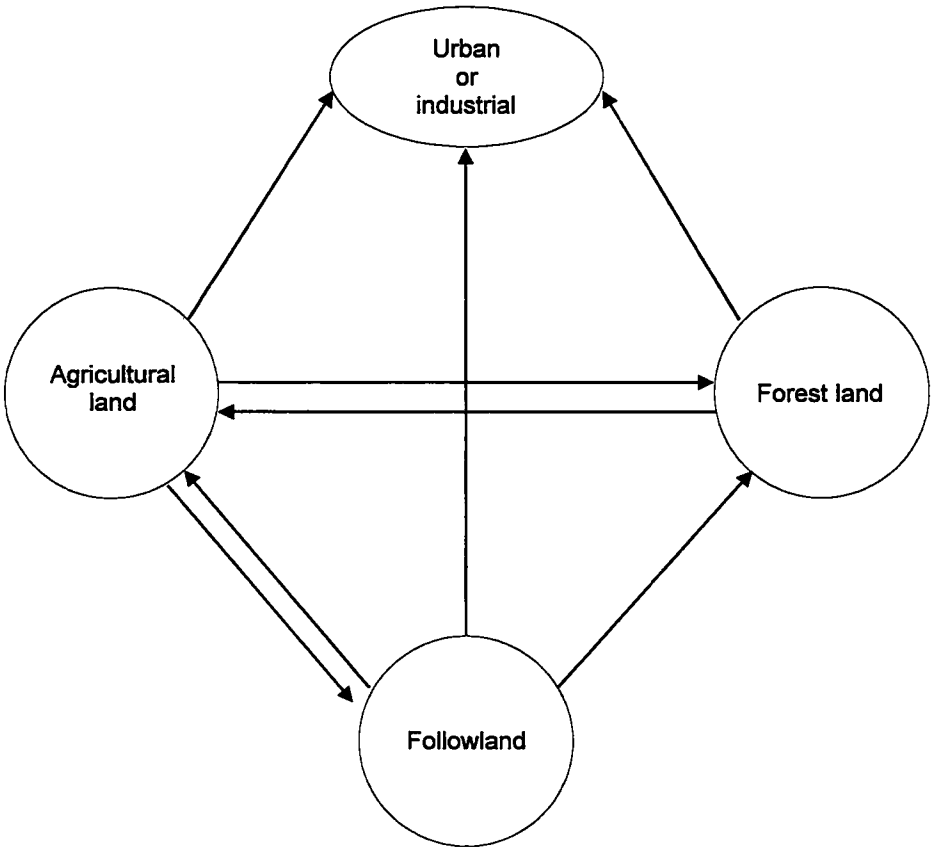

Figure 1: States diagram for land uses

[1] In France, almost 60% out of 540 000 ha. of surface area **afforestated** between 1982 and 1990, is due to natural regeneration (Normandin, D., 1994)

In fact, for land owned by agricultural households, the opportunity cost of forest use is higher in comparison with agricultural use. On one hand, this is due to the disproportion between subsidies to set-aside and those for afforestating agricultural lands (2500 to 3000 FF as opposed to 1000 FF).

There is also a difference between the length of forest rotations (several decades) and those for agriculture (only a few months). These factors combine with liquidity constraints - which prevent the household from giving up part of current consumption for resources that are unpredictable in the long term - in order to slow down voluntary afforestation of agricultural lands.

For lands owned by households outside the agricultural sector (which may include retired farmers leasing out their lands), the fiscal advantages (thirty-year property tax exemption) and the investment subsidies are insufficient to compensate for the absence or lower level of afforestation grants nor for immediate revenues, even low. In such conditions, leasing for agricultural use or leaving property as wildland seems to be more advantageous and less costly.

This result is very certainly wished for by public policy-makers (at least among those concerned with agriculture) - for reasons of food security and uncertainty related to the evolution of agricultural markets - and by agricultural organizations who frown upon losing productive lands.

However, in parallel, part of the public opinion as well as those of other policy-makers seek a better balance between commercial and non-commercial objectives, and between the preferences and interest of the current generation and those of the next generations. In certain situations, this can lead to controversy regarding afforestation subsidies such as in cases altering landscape character (O'LEARY, T.N.; McCORMACK, A.G., 1997). It is also clear that property owners themselves can be motivated by the increase in welfare obtained by the afforestation of their lands in comparison with wildland or agricultural use.

The influence of considerations linked to preferences and to amenities in the decision by private property owners to afforest is demonstrated by numerous empirical observations in France and in several other countries (NEWMAN and WEAR, 1993, PESONEN, 1995, KARPPINEN, 1995). As a result, any economic calculations enter into the realm of welfare economics. Potential positive externalities produced by private decisions justify the existence of public financial aid, which appear, from a Pigouvian perspective, to be the participation of the community in the production of externalities. Forest amenities also benefit the owner, and can influence his or her decision (Figure 2).

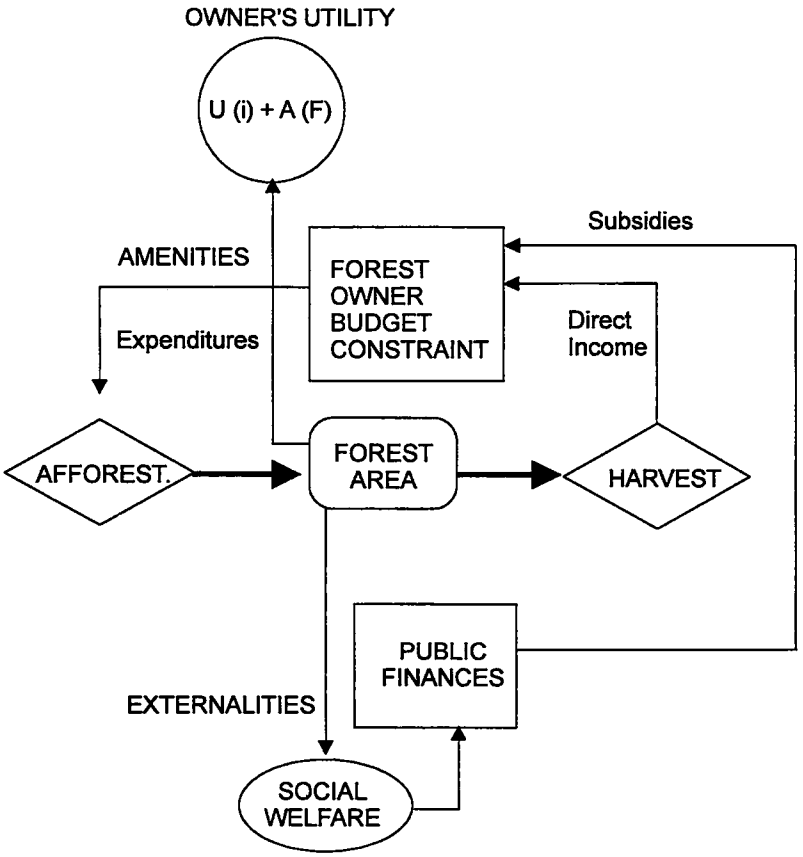

Figure 2: Welfare implications from forest management

We will structure this article in the following manner:

– first off, we shall specify the general theoretical framework of decision-making for an owner maximizing his utility over a life cycle while confronted with liquidity constraints and the inability to anticipate the commercial value of the wood resource for the harvest's time horizon. This reinforces the importance of current budget constraints and justifies the dual approach.

– secondly, we shall examine different approaches in modeling preferences for afforestation.

– thirdly, we shall develop the dual model, by integrating the discrete nature of the decision, before considering, in conclusion, the relevance of this model in elaborating public forest policy.

1. The decision-making framework : time horizon, life cycle budget constraint, liquidity constraint

In the majority of models elaborated to understand the constitution or the management of forest assets by private property owners, one of the essential parameters is the future market value of the wood harvest. In order to take into account the expected harvest date, a discounting procedure is used. This is acceptable only if financial markets are perfect (absence of rationing as well as transaction costs) and if we are able to anticipate fairly precisely the wood market situation. However, in the case of an afforestation decision, these two conditions are rarely satisfied in synchronicity (TERREAUX, 1990). In this paper, we start with the assumption that the decision to afforest property, whatever the motivation may be (retirement, passing on an inheritance to the children, amenities...), is more a function of immediate expenditure than of a hypothetical profitability calculation.

Before establishing the questions that we intend to address, we shall define the general afforestation decision-making framework, based on principles of the life cycle theory. Essentially, this involves the definition of the household objective function, and any related constraints. It is through the definition of constraints, particularly those for budget, that we can see the differences in comparison with the traditional approach using the criteria of discounted value on an infinite time horizon. It is for this reason that we shall begin by presenting the time horizon concept and the life cycle budget constraint. We will then introduce the concepts of life cycle utility and of liquidity constraint.

1.1 The decision horizon

MASSON (1995) defines the agent's horizon as the set of T weights $(\beta_1, \beta_2, \ldots, \beta_T)$ associated to instantaneous utilities at each time of life, T being the maximun length of human life, with B_t decreasing according to t, and B_1=1. The decreasing value of weights corresponds to the preference for the present. The relation between successive values is the rate of future's depreciation:

$$\beta_{t+1} / \beta_t = \delta_{t+1}$$

This depends only on age, and not the distance from the present, which would guaranty the coherence of choices over time because of the stability of temporal preferences; when the rate of future depreciation is constant, the horizon at a given age is that much longer in comparison with the years remaining to live due to a lower rate of depreciation.

The decision-maker's objective function is the discounted sum of utilities over a life cycle:

$$V = \sum_{0}^{T} \beta^{t} U(C_t)$$

with U(C): utility function, B, weighting factor or the preference for the present

(in that special case, the rate of future depreciation is constant and equal to one)

From our problem, the decision-maker is an individual private owner, for which the life expectancy is limited and uncertain. The uncertainty of a lifespan modifies the horizon, and consequently, it also modifies consumption behavior and any corresponding plantation decisions. The function objective, given an uncertain lifespan, would be:

$$V = \sum_{0}^{T} \beta^{t} s_t U(C_t)$$

In this formulation, we still consider the same maximum life span, T, but we introduce S_t, the probabilities of survival until the age t (with s_{T+1}=o). The future thus becomes depreciated with respect to the present, but this also occurs because what an individual knows of his chances of still being alive at a certain moment in the future.

In comparison with the FAUSTMAN model, the approach proposed here has two important differences: the first concerns the relationship between any economic calculations and an decision-maker, for which the temporal preferences are specified independently of the financial market, the second is related to the horizon limit, as determined by the risk of death and by the intergenerational liquidity constraint. In a given pedo-climatic situation, and for a given tree species, the optimal rotation length can be included or not within the decision-maker's economic horizon. Such a comparison would permit the definition of the decision's rationality. This might correspond to the case of a personal objective, such as seeking the increase of retirement resources or transfers between generations. It should be pointed out that the optimal rotation length or that of the revolution in the FAUSTMAN model depends on the discount rate, all else being equal, which is usually the market rate of interest. The horizon depends on the subjective time preferences of the decision maker. As such, certain decision-makers would not have the incentive of a profitable forestry project (as defined by Faustman model) where the rotation length surpasses their personal horizon. Considerations related to budget constraints, reinforce this difference.

1.2 The budget constraint in the life cycle hypothesis

Two fundamental hypotheses, each complementary for the other, characterize the life cycle models:

– the financial markets are perfect, which means that there is neither rationing nor transaction costs in the management of household financial resources over time, the only household constraint being to finish its life with zero or a positive net assets.[2]

- consequently, the household can manage the whole of the resources that he disposes of over the life cycle without incurring additional cost. Over this period, it would also have phases during which its net assets would be negative, and others during which its net assets would be positive. That means that the budget constraints which guides its choices are not current income (nor the cash on hand, including the whole of its revenues and assets) but rather life cycle resources. The sum of the discounted values of revenues received over the whole of its lifespan would be:[3]

$$L = \sum_{t=0}^{T} \frac{y_t}{(1+r)^t}$$

(with T, lifespan, assumed to be certain, and y, annual revenue, and r, the market interest rate)

The life cycle hypothesis introduces a global point of view which leads us to consider resources received at different moments in the life cycle as potentially transferable from the present onwards (which justifies the concept of present worth).

As such, the flow of regular and weak revenues may be equivalent to a less regular flow, such as, for example, the wood harvest at the end of a life cycle.

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[2] It should be noted that this is a constraint with respect to the FAUSTMAN model, which takes into account an infinite horizon.

[3] We should add here that the interest rate to be used in discounting operations is that of the financial market, as opposed to the rate used to discount elements of the objective function, which is a subjective rate, signifying the importance that the household assigns to utilities at different moments of its life cycle. These rates can be identical, but more generally, they do not coincide.

FRIEDMAN thus created **the concept of permanent income: this is the constant income p for which the discounted value over the same period is equal to the discounted value in revenue flows y_t:**

$$L = \sum_{t=0}^{T} \frac{y_t}{(1+r)^t} = \sum_{t=0}^{T} \frac{p}{(1+r)^t}$$

In a context of perfect financial markets, we can then imagine that a property owner might afforests all his land, once and for all at the beginning of his life, and indebt himself to afford the cost of living while waiting to be reimbursed by the return from a last minute harvest. In this highly unrealistic scenario, forestry would be preferred to annual crops or livestock if it produces a greater discounted value, and therefore a greater permanent income. In the same way, it would be possible to find property owners who reconvert their farm to forestry, even if they couldn't hope to get income from harvest before their own death. The absence of such behavior is in reality due to the existence of a liquidity constraint inside the life cycle. Consequently, there is a theoretical vicinity between discounting models and life cycle models which are made up from perfect financial markets hypotheses. The life cycle models, however, limit the calculation at an horizon equal to or inferior to the life expectancy of the decision-maker, and therefore implicitely assume a intergenerational liquidity constraint with respect to the Faustman model.

1.3 The liquidity constraint : its consequences for forestry decision models

Numerous factors are likely to create liquidity constraints of various forms including the following main ones: the asymmetric information between the banker and the borrower, the latter's default risk, the transaction costs, the macro-economic constraints (determination of credit rationing), the resale constraint on durable goods.... This can result in rate differences, insurance costs, rationing, a requirement for minimum self-financing of the investment...For the type of situation that interest us, no bank would accept to finance the consumption of a forest owner overall its lifecycle, even with the guaranty of a mortgage. An important consequence of liquidity constraints is that an agricultural household would never afforests its "best lands", even if its discounted value was higher than that for agricultural production income. This is why there is generally no competition between agriculture and silviculture on the best agricultural lands. Nevertheless, it is possible that a forest owner disposes of enough resources (in revenue and in assets) to overcome liquidity constraints. In the absence of intergenerational liquidity constraint[4], if the discounted value of the wood harvest is greater than the

[4] This refers to the hypothesis that a generation which plants a forest can enter into debt for present-day consumption in hope of a future harvest production.

sum of discounted values for successive annual agricultural harvests, the property would be best converted to forest production[5].

This could also be the case when the expected silviculture revenues are unnecessary to support household life cycle consumption. As an inverse hypothesis, it is clear that agricultural production, for which the delay on returns is annual, is preferred even if its present value is inferior. In this context, the constitution of a silvicultural operation producing regular income, may take several generations.

It is necessary to fully understand the implications of the two fundamental life cycle model hypotheses in comparison with criteria typically used in forest assessment. For such criteria, discounting is calculated either over an infinite sequence of forest revenues, or over a sequence corresponding to the length of a rotation (which, in most cases, exceeds an individual's active life expectancy). By considering that, as with life cycle models, life cycle resources **L** make up the significant budget constraint for the individual's decisions means that he cannot indebt himself against resources obtained from the forest after his death : all revenues to be collected afterwards are to be considered as an intergenerational transfer.

The life cycle model therefore forces us to distinguish between the case of plantations that become mature before the death of the generation which planted them and the case of those plantations that could only be harvested by subsequent generations.

In the first case, it is acceptable to integrate the discounted value of the harvest (as well as the products of intermediate thinnings) into life cycle resources. The afforestation decision is therefore analogous to the decision to buy a financial product such as life insurance. In the second case, the plantation and maintenance costs decrease the life cycle resources without accounting for the product of a final cut in the same framework - unless a real estate market exists for forested land[6]. This dichotomy introduced into the plantation models no longer depends on the anticipated economic value of the selected tree species[7], but rather on their

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[5] This is the hypothesis maintained by C.DUPRAZ in the ARBUSTRA model, as well as in the model defined by J.P. TERREAUX.

[6] This market is quite restricted and localised, and the majority of forestry transactions come from transactions with agricultural properties having woods.

[7] In certain regions, a real estate market for woodlots exists which offers the opportunity for a forest owner to receive a return on his capital before the end of the rotation. The existance of a resale value for an immature forest permits forest assets to be integrated into the houshold's life cycle resources.

biological and phenological characteristics, in given pedo-climatic conditions, and the owner's demographic characteristics at the moment of the decision. In both cases, afforestation can offer amenities to the proprietor, meaning a satisfaction linked to the nature of the plantation (species and plantation characteristics).

2. Integration of amenities into the owner's decision-making

In the standard life cycle model, household resources are managed in such a way as to maximize the objective function which can serve as an indicator of household satisfaction over the lifecycle. The only variableof the utility function would be consumption; whereas the accumulation of assets would only compensate for the reduction in resources at retirement. This base model may be nevertheless enhanced by integrating other motivations for asset accumulation, namely precautionary saving or intergenerational transfer, as well as other factors that might influence the utility function (leasure, amenities...). It is within this enlarged framework that we can deal with the afforestation decision. We assume that the property owner, whether or not the decision to afforest is taken, considers any supplementary welfare that might be of personal benefit.

2.1 The objective function

Dealing with the problem of the decision horizon we have already presented the objective function:

$$V = \sum_{0}^{T} \beta^{t} s_t U(C_t)$$

The question that arises here is related to the modeling of amenity from afforestated area. Is the amenity function different from the utility function? Or, in other words, how is the owner's global welfare affected by the existence of a forest of a certain surface area, of a certain age and of given characteristics? The value of amenities, difficult to evaluate in an monetary scale, may depends on a number of forest's characteristics, such as surface area, distance from the home, bio-diversity, plantation regime, type of vegetation cover, etc...It is logical to think that the phenomenon of satiety[8] invoked to choose functional forms for utility, is also at work in the case of private amenity from forest. Yet, we can first state that amenity

[8] This explains the decrease in marginal utility when consumption increases.

function and utility function take the same functional form and second that amenity is a function of surface area at an given age in t, Fa.:

$$V = \sum_{0}^{T} \beta^{t} s_t U(C_t, Fa_t)$$

Dealing with this type of function utility, we can consider the transfer of financial wealth or of material goods to the heirs as a particular term of the life cycle's global utility function, weighted according to the degree of intergenerational altruism of the decision-maker, g:

$$V = \sum_{0}^{T} \beta^{t} s_t U(C_t, Fa_t) + gB(Fa_T)$$

In this last equation, B is a function of heritage transfer.

The instantaneous utility function, U, can be divided into two elements[9]:

– the first based on consumption[10],
– the second with an amenity function based on the surface area of woodlands at a given age:

$$U = C_t^{\alpha} + (Fa_t)^{\eta}$$

Among the difficulties that we will encounter is balancing between the part of the objective function resulting from the consumption and the part resulting from amenities or heritage values (Fig. 3 and 4). In effect, a scenario producing a raised value for the objective function, with a component linked to the utility of reduced consumption, would not be very realistic. The utilities linked to the consumption and to forest's amenities are not perfect substitutes: the agricultural household can get

[9] We can expect that the amenity function and the function for the intergenerational transfer of wooded surface area are homogeneous, though it is not always the case.

[10] The use of this type of utility function offers the advantage of allocating a fixed part of the budget for each good, which is determined by the function's exponent. In calculating the sum of exponents for two goods equal to the same unit, we can directly interpret exponents with budgetary coefficients.

by without the forest but it cannot get by without a minimum level of consumption expenditures. It must be thought of rather in terms of complimentarity[11].

Therefore, the question of relative weighting for different variables in the life cycle utility is critical. Though its subjective nature creates estimation problems, it constitutes the essence of the decision process of interest here. Indeed, uncertainty at the time of decision making is very high, as much in its technical aspects as for its significance in economic forecasting, and the decision is in most of the cases a bet on the future[12]. In this context, the subjective nature of a decision is unavoidable. Masking it with hypothesis on the future, especially on the long term state of wood markets, would mean substituting the subjectivity of a decision-maker with that of the researcher. It seemed preferable to us to take into account explicitly the subjective nature of the decision making in the model, in order to be able to measure the the decision's sensibility to preferences parameters. We then stress an important point as conclusion: the decision making depends not only upon exogenous economic factors, related to wood market and financial markets, nor plantation parameters, but together to personal characteristics and preferences of the decision maker.

2.2 The price of amenities gained through afforestation

Of the general types of utility functions referred to above, we find that the state variable Fa_t, or the wooded surface area at age a for which a decision is made, intervenes in both household resources (mainly through investment cost, and eventually, through benefits from the interaction between trees and crops) and in the objective function. The amenity obtained by the afforestated surface area has in any case an cost, but the afforestation of lands by the owner can, in certain cases, be considered as a consumption expenditure.[13]

In this theoretical framework, the afforestation decision affects the household budget constraint and its objective function as well. The expense amount is the criteria for a decision instead of the discounted value (on a horizon independent of the household life expectancy) of the future wood harvest. This is comprised of

[11] It is the convexity of the indifference curve between the two variables which gives their degree of complimentarity. A very flat "indifference curve" indicates perfect substitution while a deep curve can indicate complimentarity.

[12] It is likely that the making of a decision, when confronted with such uncertainty regarding the end product, is more often of the following type: "On condition that the operation is financially feasible in the short and medium term..."

[13] This also explains that the majority of property owners without commercial operations prefer leaving their land as fallow.

direct plantation costs and maintenance, as well as the loss of agricultural income. By such an argument, it seems that all factors that diminish expenses (subsidies, fiscal advantages, gains related to agricultural complimentarities) act as positive incentives and allow for an afforestation policy on agricultural lands.

3. The afforestation decision

3.1 The question of the household decision

Whether the motivation to afforest lies in the creation of an inheritance, in creating amenities or in both, the constitution of a woodlot induces a fairly significant flow of expenses. There can also be revenue losses (opportunity costs) where other land uses are possible.

On condition that there aren't any interactions with other potential variables in the utility function (e.g.leasure), we can define a constant level of amenities by reasoning for a given surface area and for a given tree species. Measuring the expenses that the property owner has consented to in afforestating thus measures indirectly the utility linked to this decision. This is the dual approach of the utility maximization problem above. In general, it allows for the deduction of Hicks compensated demand functions, which gives the relation between price and the demand for a good, for a given level of utility.

However, in the case of a discrete decision, the derivation of compensated demand functions is different. This has been dealt with by different authors such as SMALL and ROSEN (1981), HANEMANN (1984) and JOHANSSON (1987). It carries consequences on the the relative importance of income and substitution effects and requires non-linear estimation methods (TOBIT).

The choice's discrete nature is modeled by the integration of a S index into the utility function. This index which would be equal to 1 if the afforestation decision is taken, and on the contrary, equal to zero. The budget constraint itself varies with respect to the value of this index. Such a modeling is typical in the analysis of durable goods consumption (DEATON and MUELLBAUER, 1980) and of environmental goods consumption (site access, hunting permits...) (JOHANSSON, 1987, HANEMANN, 1984).

Let us assume that A is the surface area of land owned. The owner household chooses to share its resources (I) between buying consumption goods q and the

plantation of a surface F in forest land at a global cost a*:

$$u = v(q, S, e)$$
$$pq + a^{*}S = I$$
$$a^{*} = p_{F} * F$$
$$F <= A$$

The allocation of part of resources for afforestation diminishes the consumption of other goods. The utility levels attached to each choice (in the absence of leasure preferences) are respectively:

$$u_0 = v(\frac{I}{p}, 0, e)$$

$$u_1 = v(\frac{I - a^{*}}{p}, 1, e)$$

According to the primal approach, the decision is taken according to the criteria of utility maximization:

$$Max(u_0, u_1)$$

As the amenities and other consumption goods are not perfect substitutes, there is a threshold in revenue under which resources are entirely allocated to consumption expenses. Let It (e) be that threshold, which is specific to each proprietor. For each, the choice is made based on the above comparison, though an exterior observer would not be aware of corresponding utility levels. An information's asymetry arises.

If we now consider the unit cost of afforestation as a variable, pf[14], the discrete choice model would be matched with the continuous choice favoring wooded surface areas. For each level of afforestation unit cost, at a given level of utility, the choice would now be made by comparing expenses. This is the dual approach.

We shall assume b to be the vector of the dual problem parameters: p being the price vector of other goods, w, vector of salaries or of unit work revenues, I exogenous income, and U the utility level:

b= (p,w,I, U)

[14] Whether or not the opportunity cost of work is included in the model.

We then can define two expenditure functions corresponding to the choice:

$$e_0(b) = p * \tilde{q}(b)$$

$$e_1(b, p_F) = p * \tilde{q}(b, p_F) + p_F * F$$

and we can write the dual problem as:

$$Min\left\{e_0(b), e_1(b, p_F)\right\}$$

Since we reason here at a given level of utility, there would or would not be an afforestation expense for each case. The dual model permits us to define, for a given utility level, a limit to the unit cost of afforestation, beyond which the proprietor gives up on afforestating any part of his land. This cost limit is proprietor specific since it depends on his preferences, on his resources and on other individual parameters. Below this cost, woodlot surface area would increase with any reduction in cost, until available land is saturated with trees[15]. For an observer, this would have the form of a random variable distributed in a whole population according to a parametric statistical law (normal or logistic). Estimating the compensated expenditure function therefore requires a two steps procedure, analogous to that used in the TOBIT model.

3.2 Consequences for public afforestation policies

We put forward the hypothesis that the public policy objective is to maximize collective welfare by integrating externalities (positive and negative) derived from proprietors' private decisions. In order to attain this objective with minimal expense, we must consider, in the case of specific policy measures, both management costs and their impact on proprietors' decision-making. For such a perspective, it is important to know if the aids have been adjusted, meaning calculated in such a manner as to tempt a sufficient number of proprietors to make the desired decision without generating excessive payments to those who would have taken an afforestation decision with reduced aids or no aids at all (COASE,). Here, the questions regarding asymmetric information availability are crucial, since the exterior observer or policy maker is not aware of the individual utility function. The proprietors who have a low cost threshold are less sensible to amenities. Aids

[15] It is clear that the surface to reforest, in the case of agricultural households, cannot be assimilated into the total surface area exploited. The share between wooded surface area and agricultural surface area can be observed in a previous calculation made on the basis of revenue maximization. The conditions of separability required for this procedure are related to preferences and the perfection of labour and financial markets.

would have to be increased to diminish their cost of operation. On the contrary, for those who have a higher cost threshold, such an aid would be less necessary and even useless[16] because such a decision would be made anyway. The probability of an afforestation decision is therefore higher when costs are lower. At a general level, the distribution of wooded surface areas that result from a given level of subsidies depends on the distribution of cost's thressholds and of available land. In the context of an environmental policy, normally sensitive to the territorial dimension of objectives, these considerations lead us to emphasize the importance of property concentration (fragmentation): properties concentrated together, while being less sensible to amenity criteria, have fewer problems in estimating the aforementioned cost limits, while permitting the gain of greater territorial efficiency. *A contrario*, a more egalitarian land tenure structure, though increasing the difficulties and the cost of public policy, also raises the proprietor's average sensibility to amenities in comparison with purely commercial considerations. To avoid the inconveniences of afforestating land in the form of postal-stamps, forest policies might be brought about to establish a minimum surface area threshold. As far as I know, this subject has barely been reasearched and might be worthy of the use of comparative empirical analyses and simulations.

Another dimension to take into account is the competition between sectorial policies, driven by the competition between social groups in rent-seeking public allowances. As such, increasing afforestation subsidies or allowing for compensatories aids on agricultural lands owned by non-farmers proprietors would certainly induce a greater and irreversible afforestation at the cost of public rent transfer. Farmers'organizations are clearly opposed to such measures. Today, in order to avoid the inconveniences of lump-sum aids, which induce public expenditure and produce rents, numerous public policies have attempted to promote aids management through contracting. This method is promising, in spite of higher administrative costs linked to the case by case negotiation of each contract and to the difficulty in obtaining appropriate expertise. However, to be efficient, this would have to be associated with zoning that considers territorial objectives and obtains desired results through the coordination of decisions by concerned proprietor's who have a diversity of preferences and constraints. The next step would then be to consider landscape or the environment as common property (MERLO et alii, 1996).

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[16] In such a context, the significance of strategy biases, which exists in any method tending to establish price limits, are better understood.

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Part III

Research needs in the field of public perception and attitudes

Development of a trans-european public concerning forest landscape issues : a reflection of current research needs

Développement d'un enjeu public européen concernant le paysage forestier ; une réflexion sur les besoins actuels de recherche

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Abstract: *This paper was written in an attempt to achieve three interrelated objectives. Firstly, to define and distinguish four commonly used research terms (attitudes, perceptions, preferences and opinions or APPO's) which are often used interchangeably in the literature. Secondly, to review recent related literature in order to suggest where future research concerning APPO's might be directed. The need to identify public preferences for, opinions and perceptions of as well as attitudes towards, forestry has never been so critical considering that the potentially high visual impact of this often ubiquitous landuse is generally controlled by a relatively limited number of decision makers. While more research has been carried out pertaining to public APPO's of forestry than any other landscape issue there is, nevertheless, a need for innovation in future studies to ensure that worthwhile findings emerge which are theoretically well founded, sufficiently detailed to inform forest design and reflect regional variation in both survey populations as well as landscape issues. This paper will highlight three main areas where particular attention needs to be paid when developing such studies, namely survey method, survey content and survey population.*

The third objective of this paper is to provide a brief overview of a public survey developed by the authors based upon the research needs identified. The survey is a major component of an EC funded research project being coordinated by the authors and involving 6 trans-European partners.

Keywords: *Attitudes, perceptions, preferences and opinions, forest landscape aesthetics, public surveys, innovation*

Résumé : Ce document a été écrit pour essayer d'atteindre 3 objectifs intimement liés.

Premièrement, définir et distinguer 4 termes utilisés couramment dans la recherche : attitudes, perceptions, préférences et opinions ou "APPO". Ceux-ci sont souvent employés de manière interchangeable dans la littérature.

Deuxièmement, réaliser une analyse critique de la bibliographie récente sur ce sujet, afin de suggérer les pistes possibles pour de futures recherches concernant les APPO.

Le besoin d'identifier les préférences, les opinions et les perceptions aussi bien que les attitudes publiques à l'égard de la forêt n'a jamais été aussi crucial alors que l'impact visuel potentiellement élevé de ce mode d'utilisation du sol omniprésent est généralement contrôlé par un nombre relativement restreint de "décideurs".

Bien qu'il y ait eu plus de recherches concernant la forêt que tout autre forme de paysage, il y a néanmoins un besoin d'innovation dans ce champ. Ceci est indispensable pour la production de résultats suffisamment détaillés pour être applicables dans l'aménagement forestiers, mais étayés sur des bases théoriques solides et reflétant les variations régionales, en terme de population échantillonnées et d'enjeux paysagers.

Le troisième objectif de ce texte est de proposer une synthèse rapide d'une enquête réalisée par les auteurs. Cette enquête est une partie majeure d'un projet européen de recherche, coordonné par les auteurs et associant 6 partenaires européens.

Mots clés : Attitudes, Perceptions, Préférences et opinions, Paysage forestier, Enquête publique, Innovation.

Introduction

The landscape in general is coming under increasing pressure due to conflicts of interest between land owners, on the one hand, and the public, on the other. The actions of landowners, while relatively limited in number, can result in significant impacts upon the aesthetic and recreational value of that land by the public (Bourassa, 1992). As a result, the public are beginning to feel they have proprietorial rights on the countryside (Lee, 1991) with landscapes which are visible from public areas, including roads, increasingly being regarded as part of the public domain. Additionally, the public are becoming increasingly sensitive to landscape aesthetic quality in general and specifically to the visual impact of man's activities (McCool, 1986). Forestry in particular is now considered by many as one of the more contentious activities for, as a potentially ubiquitous land cover, it can radically alter landscape character within a relatively short time. It should be pointed out that alteration of character neither implies nor necessitates a reduction in landscape quality; indeed, forests can often enhance the landscape. Notwithstanding, in order to reduce future potential conflicts of interest and to ensure that developments in the landscape are well received by the public, it is necessary to identify their attitudes, perceptions, preferences and opinions.

The Department of Forestry at University College Dublin commenced in October 1995 the coordination of a major EC funded research project titled Detailed Visual and Amenity Design Guidelines: Optimising Rural Resource Potential (FAIR3 - CT 94 - 1229). The acronym *ForAm* (forest and amenity) *Design* is used as an abbreviated title. This 42 month project involves the collaboration of six research teams based in Ireland, Scotland, Germany, Portugal, Spain and Greece[1]. One of the seven main research tasks of the project is to carry out public surveys in each participating country concerning forest landscape, including recreational, issues. Considering the almost unique opportunity of being funded to carry out such topical research in six diverse EU member states over a three and a half year period the authors were acutely aware of the need to ensure that the findings would make a significant contribution towards the existing body of knowledge, both in terms of methodology as well as the actual results.

Accordingly, the following three research objectives were adopted, providing an overall structure for this paper:

[1] The six research teams are based at the following institutes. (a) Department of Forestry, University College Dublin, (b) Forestry Department, University of Aberdeen, (c) Der Ludwig-Maximilians-Universität, München, (d) Departamento de Ambiente e Ordenamento, University of Aveiro, (e) Escuela Tecnica Superior de Ingenieros de Montes, Universidad Politecnica de Madrid and (f) Department of Forestry and Natural Environment, Aristotelian University of Thessaloniki

– Definition of relevant research terms (attitudes, perceptions, preferences and opinions, or APPO's)

– Brief review of available related literature in order to suggest current research needs (O'Leary and McCormack, 1995)

– Development of the ForAm Design trans-European public survey methodology.

1. Definition of Relevant Research Terms (Attitudes, Perceptions, Preferences and Opinions, or *APPO's*)

The terms attitude, perception, preference and opinion appear to be used rather casually and often interchangeably in much of the literature. It is worth considering, therefore, how each of these terms might be defined in the context of carrying out public surveys relating to forest landscape issues.

1.1 Attitudes

An *attitude* can be defined as a learned, general and consistently enduring positive or negative feeling about some person, object or issue which influences one to believe, feel or act in a fairly predictable manner (Petty and Cacioppo, 1981, Wilkening, 1973). In general, attitudes, as with values, are influenced by cultural background (Wilkening, 1973) and may comprise three response dimensions, namely cognitive, affective and behavioral (Reber, 1985). Attitudes are usually measured using, for example, a Likert scale or semantic differentials with the emphasis upon determining their direction (whether positive or negative) and intensity (strength of feeling). Focus upon identifying attitude *strength* will likely increase in future importance considering its significant influence upon the persistence of an attitude over time or attitude *stability* (Prislin, 1996).

1.2 Perceptions

The term *perception* can have many different meanings depending upon whether it is being interpreted within a biological, psychological or philosophical context. In other words 'perception' means much more than simply the literal definition as the act of perceiving. In relation to research concerning forest landscape issues, Roth (1986) provides a useful definition of perception as "the means by which information acquired via the sense organs is transformed into experiences of objects, events, etc.". Furthermore, Bruner (1957) defines perception as "the construction of a set of organised categories for the purpose of giving identity and more connotative meaning to new experiences". Given both the above definitions it would appear that

perception is a component of our mental tool-box which we use to experience the world around us contributing, therefore, towards the development of attitudes, opinions and preferences. One of the key distinctive factors concerning perception is that it tends to be predominantly concerned with immediate experiences (Wilkening, 1973).

1.3 Preferences

Preferences are concerned with a subject choosing their preferred option from a number of mutually exclusive stimuli (Wolman, 1973). With respect to public surveys concerning forest aesthetics such stimuli could include both verbal statements or images. As preferences are essentially determined by our perception of the stimuli as well as enduring attitudes and tentative opinions, we have little to learn from the identification of preferences alone, other than highlighting differences in the magnitude of rating of, for example, photographic images (Kaplan and Herbert, 1987).

1.4 Opinions

Opinions are generally tentatively held and expressible points of view, albeit based on at least some facts or data (Stratton and Hayes, 1993). The relative ease with which opinions can be swayed by, for example, media coverage renders their identification in isolation of other factors of little use in the long term planning and design of forest landscapes.

As can be seen from the above distinction, the terms attitude, perception, preference and opinion each have their own distinct meaning for researchers involved in carrying out public surveys concerning forest landscape issues. In addition, however, it is also apparent that the four concepts are somewhat interrelated and interdependent. In recognition and acceptance of such overlap the authors therefore propose, for the purposes of this paper, to use *APPO's* as an acronym encompassing the essence of the above four key components.

2. Brief review of available related literature in order to suggest current research needs

2.1 Research to date

While aesthetics and recreation are recognised and appreciated by most foresters as important multiple-use resources, their management has, in the past, been

difficult due to the limited amount of information available concerning the APPO's of the public for whom these resources are intended (Hull et al., 1984). Recently, however, this information gap has been reduced with more research being carried out on APPO's concerning forestry than on any other landscape issue (Ribe, 1989). This research has resulted in a considerable amount of important findings, many of which are useful, especially when found to be common internationally. Examples of such findings include the low appeal of fire damaged stands, uncertainty regarding preferences for natural V managed forests, preference for mature old growth trees over young forests and for clearings in the canopy and the recognition of forest openings as positive but clearfelling as negative.

In general, while the findings listed above can assist those involved in forest planning, design and management future research studies should aim to produce more informed, imaginative, detailed, regionally specific, meaningful and technically innovative findings.

2.2 Direction for future research

Based upon a review of previous research concerning public APPO's of forest landscape and recreational issues (O'Leary and McCormack, 1995) the authors identified the following three main components and sub-components deserving of special attention:

2.2.1 Survey method

– Use of both quantitative and qualitative research techniques
– Personal interviews versus self-completion postal questionnaires

2.2.2 Survey content

– Issues investigated
– Level of detail
– Consideration of landscape context
– Consideration of the dynamics of forest landscapes (temporal component)
– Incorporation of aesthetic theories
– Assessment of spatial sequences
– Impact of changing levels of awareness

2.2.3 Survey population

– Cross-cultural and trans-european research
– Regional case studies versus national populations
– Inclusion of specialist interest groups

Each of the above sub-components are discussed below.

2.3 Survey method

2.3.1 Use of both quantitative and qualitative research techniques

While quantitative methods largely provide an insight into what people like or dislike there is also a need for more qualitative methods which can be used to explain why. Traditionally there has been an emphasis upon the former method due to the obsession with elaborate statistical analysis of results and, moreover, an attempt to ensure that the findings might be representative of a larger population such as that of a country or a region within a country. The main disadvantage in using such quantitative methods when examining forest landscape issues is that much of the subjectivity inherent with aesthetics will remain unexplored. Qualitative techniques, on the other hand, such as that used by Le Floch (1996) and Hunziker (1995) are well suited to exploring important yet somewhat intangible issues such as, for example, emotional response of visitors to forest interiors, cultural relationship of public to trees and forests and exploration of the cognitive prototypical models used by the different populations to define their understanding of the concept of *forest.* Burgess (1996) in her editorial titled 'The Future for *Landscape Research*' calls for more ethnographic research, involving in-depth discussion groups and discourse analytical techniques in order to provide an insight into "the meanings, hopes and fears of lay people". Burgess emphasises that such findings can better serve the needs of professionals, including policy makers.

Qualitative studies are commonly restricted to being used as a forerunner to quantitative surveys with the main emphasis upon ensuring that issues selected for investigation by the researcher are likewise deemed to be either of interest or of relevance to the population being consulted. A classic example of such studies includes the focus-group interview technique such as that used by Lee (1991). There appears, however, to be very few, if any, examples of where quantitative surveys are followed-up by qualitative in-depth interviews. Surely researchers are missing the opportunity of gaining insight into the motives and reasons behind stated APPO's by not completing the logical sequence of (a) focus group interviews, (b) quantitative survey and (c) in-depth exploratory interviews.

2.3.2 Personal interviews versus self-completion questionnaires

The benefits of carrying out qualitative research has been highlighted above. When considering quantitative surveys in isolation, however, an important distinction must be made between personal interviews and self-completion questionnaires. The scope for investigating complex and / or subjective issues is more limited when using the latter method due to the fact that the respondents are left to their own devises to complete the survey without assistance. Consequently the survey must comprise questions which are unambiguous and simple to answer, especially considering that the level of formal education among respondents may be relatively

low. Accordingly, the survey designers must compromise between what they would ideally like to investigate and what they feel the respondent population could reasonably handle. Such compromises are regularly made for reasons of economics as self-administered postal questionnaires are deemed to be cheaper to complete than personal interviews per target respondent. This assumption ignores one very significant factor, however, namely response rate. There appears to be tremendous variation in response rate throughout Europe ranging from 80 - 90% in parts of Scandinavia to 20 - 35% in Ireland to as low as 5 - 10% in rural Mediterranean regions (personal communication with EU research colleagues). A researcher in, for example, Spain would, therefore, likely have to post up to ten times as many questionnaires as a colleague in, for example, Denmark in order to achieve the same number of completed surveys. This being the case, the economic arguments in favour of using the postal method are without foundation. An additional and equally strong argument against the use of postal questionnaires in low response rate regions is the likelihood of significant respondent bias, with only those who have a particular interest replying.

2.4 Survey content

2.4.1 Issues investigated

Many of the findings of public APPO studies carried out so far might be applicable to populations other than those among which the surveys were carried out. Such universality might, for example, be especially relevant to preferences for different forest interiors such as those identified by Koch and Jensen (1988). The preference for ease of visual and physical penetrability through a diverse forests is likely to be common to humans in general and not simply specific to selected research populations. Likewise, clearfelling is surely a contentious issue with all populations, irrespective of nationality or extent of forest culture (Ribe 1989). On the other hand, there are likely to be many forest landscape aesthetic issues which are regional specific and which deserve more research attention especially considering the importance of developing of regional forest landscape planning policies. The challenge for future researchers will be to identify and investigate forest issues which are specifically relevant to not only individual populations, whether on a country or sub-regional basis, but also to certain landscape character types (LCT's) within such countries or sub-regions. Such LCT's might include mountainous, coastal, rolling lowland or planar.

2.4.2 Level of detail

One of the primary objectives of carrying out forest landscape research is to provide the basis for the development of detailed and practical forest landscape design guidelines. Considering the level of afforestation in countries such as Ireland, where the forest area is to be doubled in the next 35 years (Anon., 1996),

the need for regional specific design guidelines is nothing less than urgent. It must be emphasised, however, that the results of public surveys, no matter how innovative, remain impotent unless we can find means of effective implementation on the ground. Therefore, in order to ensure the viability of APPO studies by effective implementation of their results, it is vital that research is focused upon forest attributes which are actually under the control of the forest designer or manager.

A possible criticism of existing forest design guidelines such as those provided by Lucas (1991) and the British Colombian Forest Service (Anon., 1994) is that they fall short on providing sufficient detail for forest managers who may have no formal training in design. Taking the contentious issue of clearfelling as an example, what is now clearly required is more research which pays particular attention to details and the specifics of design. Karjalainen's research (1996) makes some progress in this regard, highlighting the importance of coupe size and shape as well as ground preparation, aesthetic quality of retained trees and density of ground vegetation. It should be noted that Karjalainen's results suggests that negative attitudes towards clearfelling are not absolute.

2.4.3 Consideration of landscape context

A common convention in public APPO research studies has been the isolation for investigation of specific forest features independent of landscape context. This is especially common where images are used to establish preferences and where there is an attempt by the researchers to avoid the inclusion of any other landscape feature, including landform, which could distract or influence the respondent. In the future, however, research should no longer simply avoid addressing this important issue, especially as we strive to develop more regionally applicable forest planning and design guidelines.

One method of investigation which might be particularly appropriate in highlighting the possible influence of landscape context on APPO's would be to create alternative simulations of forest landscapes. Thus, when investigating the tolerability of exotic conifer species, for example, a forest comprising such species could be superimposed onto a number of images, each depicting different landscapes character types. Respondents could then be asked how well they feel the forest integrates with each respective type.

2.4.4 Consideration of the dynamics of forest landscapes

Forests are dynamic landscape elements, their appearance and recreational value changing significantly through the cycle of planting, thinning, harvesting. Present APPO's could alter significantly if the public were aware of possible future changes.

It is generally accepted that the landscape issue which the public most often react against are broadscale or sudden changes in landscape character or aesthetic quality (Willis and Garrod, 1992). Therefore, APPO's concerning the impact of landscape changes brought about by either the introduction of new forests or alteration of existing forests should be identified. The knowledge gained through such research could possibly be used in an attempt to predict the future visual and amenity quality of forests and woodlands.

While some important research concerning APPO's for forest landscape interiors of different ages has been carried out, to date consideration of external or macro forest landscape dynamics has been largely ignored. Such research would surely provide exciting insights into, for example, the tolerability of clearfelling relative to the length of time taken to mitigate its adverse landscape impact.

2.4.5 Incorporation of aesthetic theories

The aesthetic value of landscape to the public cannot be accurately determined by simply assessing visual preferences of landscape scenes as represented by photographs or slides (Andrews, 1979). We must recognise that landscape aesthetic quality depends not only upon the physical attributes of the landscape as observed, but also upon the more complete experience of observers themselves which is conditioned by, for example, personal and cultural upbringing, aesthetic expectations and education (Daniel et al., 1973). We need to be aware that landscape aesthetic quality can neither be reduced to the level of the objective nor be readily quantified but, rather, has many subjective and interrelated modes. For example, environmental cognitive psychology has attempted to explain aesthetic response to landscape on the basis of the basic human needs for habitat (Dewey, 1958), survival (Appleton, 1975) and information processing (Kaplan, 1979).

The need, therefore, to develop and incorporate theories of landscape aesthetics into public apprehension studies is central (Ribe, 1990). If we fail in this regard the consequence will be that information used by decision makers will not only be incomplete, but more importantly, could be substantially irrelevant.

2.4.6 Identifying preferences for spatial sequences

The majority of forest landscapes, both internal and external, are experienced by the public while in motion, whether by travelling by vehicular transport or simply walking. Many public surveys, however, simply comprise a broad range of individual predetermined forest scenes which collectively attempt to represent the major components of forest experience. Theories of aesthetics would suggest, however, that the relative disposition, combination and interaction of such components can be more significant than the perception of the individual components themselves (Kaplan, 1985). For example, a well lit mature broadleaved woodland might generally be preferred over dense coniferous forestry, but this

should not be automatically accepted as the experience of spatial, formal, textural and colour contrast and juxtaposition as experienced sequentially and collectively can ultimately be far more critical to preferences (McCormack and O'Leary, 1995). Therefore, future research should attempt to compare, for example, the experience of walking through broadleaved woodland with that of dense coniferous woodland, or moving from one type of woodland to the next with the resulting changes in space, form and light, the three major components of forest architecture. If preferences with respect to spatial sequences or forest architecture could be identified, either directly on-site, as with and Kroh and Gimblett (1992), or through the use of computer generated walk-throughs or video, then forest designers and managers could quite easily create more desirable spaces and experiences by varying the disposition of landscape elements, both natural and human made.

2.4.7 Impact of changing levels of awareness upon apprehension

Experience with and knowledge of a topic or issue has been clearly shown to have a significant influence upon the strength and stability of attitudes (Prislin, 1996). Researchers need to be conscious, therefore, how volatile public APPO's can be both in the long and short term. For instance, public *opinion* can completely shift within a single forest rotation resulting from increased aesthetic and ecological awareness following media exposure. Would, for example, the public express the same predominantly negative feelings towards clearfelling if they fully understood that harvesting is an integral and necessary part of forest management and that felled areas are usually quickly re-established. Considering the rapid afforestation current taking place in some European countries, coupled with the recognition that public APPO's can change considerably over time, repeat surveys over extended periods (eg. 10 - 20 years) are clearly warranted. An excellent example of such research is provided by Koch and Jensen (Koch, 1978 and Koch and Jensen, 1988). While their findings generally conclude that Danish public preferences have changed little over 10 years, it must be emphasised that their research has focused primarily upon forest recreation and internal forest landscapes with little consideration of the macro afforestation issue.

The findings of surveys should be analysed to identify both issues which are (a) well founded and (b) those which result from a low level of understanding. The practical outcome of this could be a public relations exercise which could possibly target those APPO's which may be misinformed with a view to clarification and, possibly, alteration to the benefit of the forest industry.

2.5 Survey population

2.5.1 Cross-cultural and trans-european research

Landscape apprehension can be significantly influenced by cultural background due to the meanings embodied in different landscape character types by different

populations (Yu, 1995). When considering forest landscapes in particular, cultural variation in APPO's will likely be influenced by many diverse factors, including those listed below:

extent of forest cover

– level of general familiarity with and experience of forests predominant function of forests (eg. wood production versus recreation) and importance of forests and trees to local economy; importance of forests and trees in local / regional history degree to which reference to forests and trees are featured in local folklore, stories, music or poems relative importance of timber products in everyday life

– demographic variables

Considering the numerous factors affecting regional variation in public APPO's of forest landscapes, further research across different countries and cultures is clearly warranted. Research is this area has been predominantly limited to comparing apprehensions in the United States with (a) Eastern (eg. Yu, 1995; Nasar 1984; Yang and Kaplan 1990) (b) Australian (Kaplan and Herbert, 1987) and (c) European populations (Shafer and Tooby, 1973; Zube and Pitt, 1981). While many of these studies show relatively high agreement between different cultures with respect to preferences for general landscape scenes, only a few efforts have been focused specifically upon forest landscapes (Kaplan and Herbert, 1987).

Some of the most significant benefits of carrying out cross-cultural research include the opportunity to compare and contrast APPO's between different countries as well as the possibility of using findings in one country to estimate future APPO's in another perhaps less forested region or one which has a weak forest culture. In addition the findings of such research, in conjunction with other regional socio-economic and environmental studies, could be used to develop a more informed and regionally specific European forest policy.

The carrying out of cross-cultural research is rarely feasible due to the lack of not only sufficient funding but also a framework within which different countries might collaborate. An excellent example of such a framework is provided by the (forestry) COST Action E3, Working Group No. 1 Public Perception and Attitudes. The fruitful interaction within this group has provided the impetus to develop a truly trans-European research proposal submitted in March 1997 to the European Commission under the FAIR Programme. The title of the proposal is *Multifunctional Forestry and Afforestation as a means to Rural Development: Attitudes of Rural Landowners and the Public* (Anon., 1997). If successful, this project would involve the collaboration of twelve EU member states and two non-EU member states. An example of current interaction is the ForAm Design research project which is the first trans-European study concerning forest landscape aesthetic and recreational issues and involving a focus upon public APPO's.

2.5.2 Regional case studies versus national population

Most countries can be sub-divided into sub-regions differing with respect to such factors as population density, landscape character, extent of forest cover and so on. Therefore, it is reasonable to presume that there would likely be significant variation within a national population concerning forest landscape APPO's. While many surveys are based upon national populations it would likely be more interesting and worthwhile to base future research upon regional case studies. In a pilot survey carried out by the authors in March 1997 two populations in Ireland (total n = 48) were asked if they approved of the Government's forest strategy to double the area of land covered by forestry. One hundred percent of one population supported the strategy compared with only twenty one percent of the other population.

2.5.3 Inclusion of specialist interest groups

While a considerable amount of social research has been based upon university student populations, an increasing number of studies have chosen to use members of the general public, a move welcomed by Burgess (1996). Consideration of other interest groups, however, such as environmentalists, landscape architects, regional planners, forest managers, farmers, tourists and recreationalists will likely become increasingly more important in the future (Jensen, 1993, Hunziker, 1995). Involvement of such specialist interest groups could provide forest landscape planners and managers with more detailed and useful information underlying APPO's concerning, for example, forest recreation. An example of one such recent study is provided by DeLucio and Múgicia (1994), identifying the specific preferences of a number of such forest user types as hikers, causal visitors and 'conservationist mountaineers'.

3. Development of the foram design trans-european public survey methodology

Having highlighted possibilities for achieving innovation in future research this paper will next focus upon the current ForAm Design research project being coordinated by the authors. It should be noted that the authors have attempted, in so far as is possible, to address many of the research needs highlighted in Section 3.0 above in the development of the ForAm Design research strategy. Before outlining the main content of the proposed research, however, the authors thought it would be useful to summarise some of their experiences to date concerned with coordinating such an international effort.

3.1 Foram design survey challenges

Development of a survey methodology for application in six diverse EU member states is not without difficulty, especially considering the objective for ForAm Design

is to compare and contrast forest landscape APPO's among the partner countries involved. Challenges encountered by the authors are highlighted below under the headings of cultural, conceptual and practical.

3.1.1 Cultural

– Interpretation

One of the first challenges to arise was how to define the meaning of *forest* as forests in the participant countries have markedly different functions, comprise different species and are managed using different silvicultural systems. In addition, there exists broad variation in terms of cultural association with forests making the use of a common survey difficult.

– Language

Different terms may be preferred by different project partners to describe the same concept, eg. "multiple-use forestry" / "multi-functional forestry". In addition, the researchers had to be careful that the precise meaning of questions was not lost or altered during translation into the four non-English languages (German, Portuguese, Spanish and Greek).

3.1.2 Conceptual

– Subject area

Identification of common research topics which facilitate comparison of APPO's between different countries can be very difficult and requires intensive and on-going collaboration among partners. Such collaboration was found to be most fruitful where it involved face to face meetings, albeit incurring significant travel costs. With such trans-European cooperation it is especially important that all involved understand and appreciate the other partner's situation, constraints and potential problems. While making direct comparisons between the participating countries is of prime importance, some leeway had to be allowed for inclusion by individual partners of regional specific issues which might otherwise be irrelevant and, therefore, confusing to other nationalities.

– Previous research concerning public preferences

The amount of previous research concerning APPO studies varies between the partners involved. For example, while extensive research in this area has been carried out in Germany, very little has thus far taken place in Ireland. In developing a quantitative questionnaire, therefore, considerable effort was necessary to ensure that common questions to be used by each partner would not result in over-repetition of previous research.

3.1.3 Practical

– Survey costs

The variation in cost of administering surveys in different partner countries can have a considerable impact upon research potential, especially if each partner has to operate within the same budget. The impact of such variation essentially determines the number and distribution (location) of respondents which can be interviewed by each partner.

– Selection of respondents

Not all partners have access to a national population database where respondents can be randomly selected by computer. Some partners, therefore, have to resort to other sampling methods, such as using telephone directories, which may increase bias.

– Response rate

The Foram design research group had originally intended to carry out the survey using self-completion questionnaires. The inevitably huge variation in response to postal surveys (from 5 - 60%), however, required consideration of using personal interviews as an alternative method. While completion of personal interviews can be expensive, the significant benefits of being able to investigate subjective issues far outweighs possible budget constraints.

3.2 Contents of Foram design survey

A brief review of the Foram Design survey will be structured under the same three headings as used under Section 3.0 of this paper, namely survey method, survey content and survey population.

3.2.1 Foram design survey method

The research strategy being used to investigate public APPO's of forest landscapes comprises both quantitative and qualitative approaches.

3.2.1.1 Quantitative component

The quantitative component involves a survey questionnaire to be administered by personal interviews. The questionnaire will comprise the following two components:

– Closed verbal questions with optional answers to be considered by the respondent.

– Forest landscape images (including computer generated simulations) for aesthetic rating.

Many of the research needs highlighted previously will be investigated using this method.

3.2.1.2 Qualitative component

The qualitative component will be implemented following completion of the quantitative questionnaire with the objective of gaining a deeper understanding behind the stated attitudes, perceptions, preferences and opinions. This later study will involve detailed personal interviews carried out by researchers experienced in the fields of environmental and cognitive psychology. Problem-centered interviews will be used to generate hypotheses to be later tested by a more deductive approach such as focused interviews. Both interview types will comprise open-ended questions followed by probes used to obtain more detailed information concerning APPO's as well as inform the development of prototypical cognitive models. The principle of greatest possible openness will be adhered to at all times to ensure the interviewer does not lead the subjects.

The Foram design group will attempt to use the qualitative method to address any remaining research needs which could not be tackled adequately using the quantitative method.

3.2.2 Quantitative survey content

Setting the context for the respondent
Prior to undertaking such a survey, clarification of terminology is crucial. The very concept of forest needs to be unambiguously established. Is there a difference between 'forest' and, for example, 'woods' or 'woodland'? To minimise confusion, the researchers have decided to provide an introductory page to the survey to make it clear that, at least for the purposes of the survey, the three terms above are collectively referred to as *forests*. This introductory page comprises verbal clarification and also eight photographic images of different forest landscape types. The forests depicted mostly differ with respect to species composition, size and shape and the photographs would both internal and external scenes.

3.2.2.1 Topics for investigation

The topics of interest to the researchers will be investigated using both verbal questions and colour images. These are elaborated below.

3.2.2.2 Verbal questions

The verbal questions will require respondents to simply choose the optional answer which most closely corresponds to their own view. The issues to be investigated and information types sought are included in *Table 1* below.

Issue	**Information type**
- Frequency of forest visits	Response - behavioral
- Reasons for not visiting forests more often for recreation	Attitude
- Extent of participation in a diverse range of forest activities	Response - preference
- Overall impressions concerning the recreational quality of forests	Opinion
- Emotions experienced during forest visits	Response - perception
- Satisfaction with the present extent of conifer, broadleaf and mixed forest cover in the respondents' county as well as in Ireland generally	Attitude / opinion
- Preferences concerning different forest management regimes	Preference
- Cultural relationship with trees/ forests	Attitude / perception
- Willingness to pay for an increase in area of forests	Preference / attitude
- Knowledge concerning the distinction between conifer and broadleaf species	Awareness / perception

Table 1: The issues to be investigated, including information types, in the Foram design quantitative survey

The majority of the above issues will be included in the questionnaires being used by each of the six partner countries, with some exceptions allowing for additional inclusion of regional specific issues. Each of these issues is discussed in more detail below.

– Frequency of forest visits

Forests which are open to the public can play an important role in terms not only of providing a valuable recreational amenity, but also in portraying a positive image of the forest industry. The researchers hope to use the first two questions to demonstrate the variation in frequency of forest visits both within and between participant countries.

– Reasons for not visiting forests more often for recreation

This question will be used to demonstrate the variety of reasons used by the different sample populations for not visiting forests more often. It is anticipated that most of the factors affecting peoples' decisions in this regard could be positively influenced by the forest industry through public relations campaigns. In this way the future likelihood of hearing such a statement as: 'I don't know where there are nice forests to visit' or 'forests bore me, there's nothing of interest there' could be minimised.

– Extent of participation in a diverse range of forest activities

Forests can often provide the opportunity for the public to derive a diverse array of benefits, both recreational (passive and active) as well as material (eg. picking berries). The level of participation in such activities, however, is thought to be considerably varied both within and between the partner countries. Rural populations from regions with only recent forest cover, for example, would likely only engage in passive activities such as walking. Urban populations situated in close proximity to mature forests, on the other hand, would likely participate in a greater number of more diverse activities.

– Overall impressions concerning the recreational quality of forests

Very little information exists on opinions regarding forest recreational quality. Respondents will be asked the degree to which they agree or disagree with statements regarding the quality of key forest recreational attributes. The responses will ultimately provide an indication of where improvement in the recreational quality of forests may be necessary.

As with the second issue described above, most of the forest attributes included in this investigation can be positively manipulated by the forest manager, ensuring that the results of the questionnaire can have practical application.

– Emotions / feelings experienced during forest visits

Much more research needs to be carried out concerning emotions experienced by people during forest visits. The findings of such research would make a useful contribution to the debate concerning the use of aesthetic theories in the

appreciation and appraisal of landscape. While this subjective issue is difficult to investigate and quantify, some insight can be gained by analysing peoples' actual on-site forest experiences. This mode of investigation is facilitated by the direct interview method. Respondents will be asked to consider four pairs of opposite emotions, and a three point scale will be used to indicate the degree to which they associate their experiences in forests with a positive or negative feeling. The four pairs of emotions are peaceful v irritated, safe v fear, uplifted v deflated and delighted v bored.

– Satisfaction with the present extent of conifer, broadleaf and mixed forest cover in the respondent's sub-region as well as in their country generally

The extent and species composition of forest cover varies significantly between the different participant countries. The objective of these questions is to investigate whether there is any relationship between the acceptance of a given forest type and the extent of cover of that type in each study region. If, for example, one were to believe the lobby opposed to commercial forestry in Ireland it would appear that a significant number of people are opposed to commercial forests. The survey may well dispel this notion.

– Preferences concerning different forest management regimes

Forests in each of the partner countries are managed in accordance with a variety of priorities such as environmental protection, timber production and recreation. This question will investigate the level of priority to which the respondent populations attach to each management alternative. The analysis of the answers to this question should provide a reasonable insight into how a selection of European populations feel that forests should be planned and managed.

– Cultural relationship between the region's population and trees / forests

The results of the proposed survey will highlight the diversity of APPO's throughout Europe concerning forest landscapes. One of the most significant reasons behind such diversity is likely to be the variation in the cultural relationship between the population and trees / forests in the different regions. This is a product of the historical interaction between people and their forests. The affinity between the Irish and forests, for example, has long been lost. Indeed, the development and sustaining of such a relationship has possibly been thwarted due to the historical association in the national rural subconscious of wooded demesnes with occupying landlords. In Germany, however, an empathetic multiple use of forests has continued more or less throughout history. This question will attempt to explore this relationship in a preliminary way. It will be later followed by a more detailed study during the specifically qualitative research phase.

– Willingness to pay for an increase in area of broadleaf forests

Many countries in Europe are currently undergoing major afforestation programmes which are financially supported by planting grants from the European Commission. As yet the public have not been consulted regarding the type of forests they would like to see being established as part of these programmes. The contingent valuation question to be used in Ireland will estimate the price the public are willing to pay for an afforestation programme comprising broadleaf species. The precise content and wording of this question will reflect the differences in national policy concerning forest expansion and species composition in the different partner countries.

– Knowledge concerning species

An earlier question attempts to identify preferences between three main forest types, namely conifers, broadleaves and mixed. In any study involving a debate between forest types, however, it is of primary importance to establish if people can make the distinction.

This matter will be investigated both verbally and visually, to find out whether people can recognise relatively common species of trees, including oak, spruce, ash, pine and beech.

4. Colour images to be used in the quantitative survey

The researchers are especially keen to incorporate visual aesthetic issues into the survey, and to this end a number of alternative forest landscape images will be presented to the respondents for rating on a seven point visual aesthetic quality scale (*Figure 1*). In an attempt to select images for use in the survey each partner initially identified key forest landscape issues relevant to their respective country.

As many studies have been carried out which examine preferences for forest interiors, it was decided to concentrate primarily upon external landscapes in this research. The final choice of images to be used reflects the most contentious current issues, which (in some of the partner countries) may involve conflicts between foresters and not only the public but also planning authorities.

The images to be used in the survey will be based on slides of forest landscapes. Each issue, or theme, will typically, but not exclusively, involve three similar landscape scenes differing only with respect to the issue under investigation (one original slide taken in the landscape plus two simulations).

The production of the simulated forest scenes depicting possible variations from the original involves the use of raster-based image manipulation software to ensure photorealism, i.e. accuracy not only of form, line and scale, but also of colour and texture.

Please rate the photographs using the scenic beauty scal

I do not loke it at all *I like it very much*

1 2 3 4 5 6 7

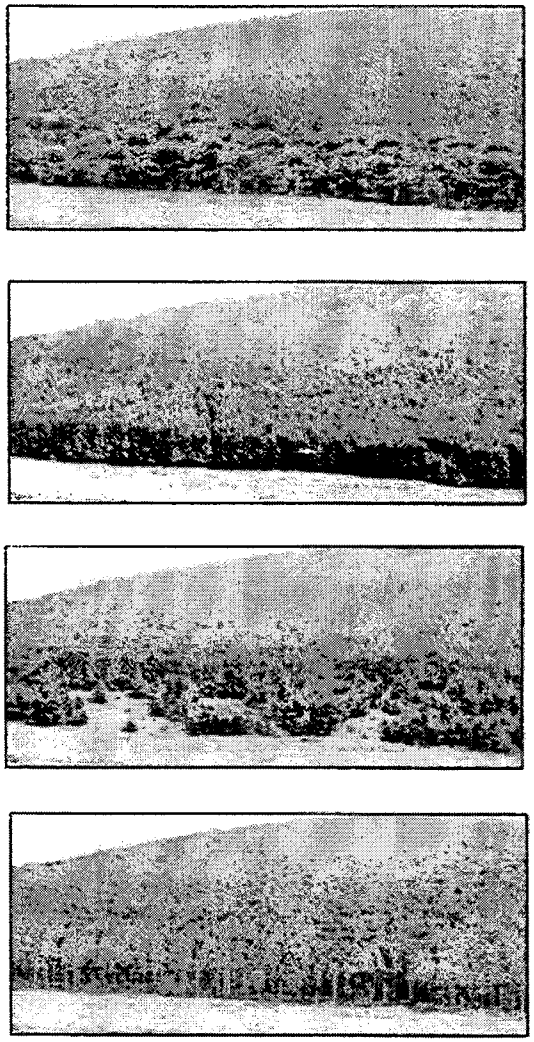

Figure 1: Photorealistic simulations depicting alternative methods of improving aesthetic integration of forest with agricultural land. The images will be rated using the "Scenic Beauty Scale"

In order to produce the simulations for the ForAm Design research the following important factors had to be considered:

– In an attempt to ensure that they should be unknown to the respondents the researchers have ensured that the landscapes depicted are not extraordinary.

– The original slides were carefully taken to ensure that the main focus of interest in the image corresponds to the theme being investigated, reducing the possibility of the respondent being distracted by other features.

– The researchers had to find a balance between producing simulations which, while significantly different to allow them to be easily distinguished from each other, are sufficiently similar so as not to bias the respondents in their assessment.

Depiction of regional specific issues by each partner

As the character and aesthetic quality of each partner's case study landscapes differ markedly with respect to landform and landcover, it would not be valid for all partners to use the same images in this component of the survey. There may well be scope for using the same images depicting forest interiors, however, due to the reduced possibility of respondent confusion caused by landscape context. To this end, the issues listed below, including alternatives to be depicted graphically, pertain to Ireland only:

– Silvicultural systems
Clearfelling v uniform shelterwood v group selection

– Forest roadside edge
Narrow parallel v undulating v wide parallel

– Forest species
Mixed v conifer v broadleaf

– Integration of small scale 'postage stamp' plantations
Undulating v hard v broadleaf edge

– Forest plantation edge (figure 1 depicts the first four of the following six options)
Generous broadleaf v hard conifer v soft conifer v generous broadleaf with hedgerows v conifer outliers v broadleaf skim

– Knowledge concerning the distinction between conifer and broadleaf species to be depicted by both internal and external views

Finally, photographs of both broadleaf and conifer forest interiors will be included for independent rating.

4.1.1 Foram design survey population

Because of the likely variation with respect to public APPO's of forest aesthetics both within and between the partner countries, the researchers have chosen not to base the proposed research upon national populations but, instead, to use case study regional respondent groups. The regions selected thus far by the partners are listed below, and are mostly defined by political or administrative boundaries.

Ireland:	County Wicklow	Scotland:	Highlands
	County Leitrim		Lowlands
Germany:	Upper Danube Valley	Portugal:	Gondomar
	Stuttgart		Agueda
Spain:	Madrid	Greece:	Chalkidiki county
	Vitoria		
Parnassos mountain:			

Given that these regions have been especially chosen to provide the basis for developing the proposed design guidelines, the researchers are very familiar with their associated aesthetic and recreational issues.

The minimum number of completed responses for both study areas in Ireland will be 400, achieving a percentage margin of error of 5%, assuming a 95% confidence interval and a percentage occurrence of 50% (Levin and Fox, 1988). Different sampling frames will be used by the six project partners to select the sample population. The primary objective, however, will be to ensure that the selection process is as random as possible, reducing bias in the results.

Conclusion

The public are becoming increasingly sensitive to landscape aesthetic quality at a time when many European countries are undergoing massive afforestation. This heightened level of public interest is reflected in the amount of recent literature published exploring attitudes, perceptions, preferences and opinions (APPO's) concerning forestry. Following a brief review of such literature it is recognised that while many valuable results have emerged, there is, nevertheless, considerable scope for innovation. This paper has attempted to highlight several areas where future research might be directed, under the three general headings of survey method, survey content and survey population. Finally, this paper outlines the content of a trans-European public survey concerning forest landscape aesthetics and recreation which is being coordinated by the authors and is due for completion by May 1998. It is hoped than many of the research needs identified will be addressed in this survey.

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From general public to forest owners ; some leads for a european research

Du grand public au propriétaire forestier ; quelques pistes pour une recherche européenne

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Abstract: *The research projects on the relations between forest and society are in full development, but this research area is still new and raises many methodological discussions. The authors, in this article, draw the conclusions of the « Public perception and owners' attitudes towards forest and sylviculture » working group, that met regularly during 3 years.*

Most of the projects concern the public perception, but a global vision on a European scale is still missing, and the results cannot yet be applied at the manager's level. Taking into account the time parameter is an essential point.

Research projects on the owners' attitude are just beginning, and the interest of an economic approach of the owners' decision processes is stressed.

The confrontation of social demand and owners' attitude remains the main gap of the current research system. This amounts to raising the question of the mode of payment of the non-commercial benefit of forests.

Résumé : Les travaux de recherche sur les relations entre la forêt et la société sont en plein développement mais ce champ de recherche est encore récent et soulève de nombreux débats méthodologiques. Les auteurs tirent dans cet article les conclusions des travaux du groupe de travail "Perception publique et attitudes des propriétaires envers la forêt et la sylviculture", réuni régulièrement pendant 3 ans.

Les travaux sur la perception du public sont les plus nombreux, mais il manque encore une vision globale au niveau Européen, et les résultats ne sont pas encore transférables au niveau du gestionnaire. La prise en compte du temps est une question essentielle.

Les recherches sur les attitudes de propriétaires en sont à leur début, et l'intérêt d'une approche économique des processus de décision des propriétaires est soulignée.

La mise en regard de la demande sociale et des attitudes des propriétaires reste la lacune majeure du dispositif actuel de recherche. Ceci revient à poser la question des modalités de rétribution des fonctions non marchandes de la forêt.

Introduction

La forêt a longtemps été considérée seulement comme une richesse économique et/ou une richesse biologique. La recherche forestière s'est donc développée principalement autour de ces axes, qu'elle a décliné en terme d'aménagement forestier, de techniques sylvicoles, de fonctionnement de la filière, de fonctionnement de l'écosystème.

Mais, avec la concentration urbaine, la montée des préoccupations en terme d'environnement et de gestion durable, la forêt est devenue un véritable enjeu social. De ce fait, les recherches sur les relations entre la forêt et la société, qui n'avaient jusqu'alors été entreprises que par de rares précurseurs, ont suscité un nouvel intérêt. L'inventaire préalable mené sous la direction de Niels KOCH a fait apparaître que ce domaine de recherche était très actif. 75 projets ont été inventoriés pour près de 3000 hommes x mois. Néanmoins, l'intérêt porté à ce thème est très variable selon les pays, avec une certaine avance des pays nordiques et notamment de la Finlande. De plus, les travaux sont en général récents, ce qui fait que beaucoup n'ont pas encore donné lieu à publication, et que les méthodes sont encore très disparates et souvent controversées. Enfin, le champ des questions est loin d'être couvert de façon homogène, et une proportion importante des travaux s'est concentrée sur la perception de la forêt par le public. L'ambition de notre réflexion a été d'analyser l'objet et les méthodes des travaux menés actuellement en Europe sur ce thème, et de proposer quelques pistes nouvelles d'intérêt commun.

Nous examinerons successivement les deux volets principaux de cette question : les attentes de la société d'une part, et les attitudes des propriétaires forestiers de l'autre. Puis nous aborderons le problème de la rencontre entre ces deux aspects et donc celui de la négociation sociale.

1. Perception de la forêt par le public

Cette question de perception du public et des attentes de la société se trouve fortement imbriquée avec les recherches menées dans le champ du paysage. Une typologie des recherches en cours peut être bâtie en opposant sur deux axes :

– des travaux sur la perception de la forêt en général, opposés à des études plus ciblées sur la réaction du public à des facteurs spécifiques d'aménagement ou de gestion (types de sylvicultures, aménagements récréatifs, choix des essences....).

– des travaux menés à l'échelle nationale souvent grâce à des enquêtes sur des échantillons importants de population, et d'un autre côté, des travaux menés à l'échelle locale et en référence à un contexte culturel et environnemental très spécifique.

Bien que les travaux sur ce thème soit les plus nombreux, il faut bien reconnaître qu'à l'échelle européenne, les connaissances sur les attentes de la Société à l'égard de la forêt sont encore très incomplètes.

Il manque notamment une vision de la variabilité de ces attentes en fonction des contextes régionaux. Or l'identité régionale devient un enjeu majeur dans une Europe qui s'élargit et qui s'ouvre largement sur le monde. La connaissance de ce qui contribue à forger cette identité ou qui au contraire la menace à travers les évolutions de l'occupation de l'espace, doit faire l'objet d'investigations plus soutenues et la forêt est un des éléments qui entrent dans ce cadre.

Par ailleurs, si il existe des bribes de connaissances, celles-ci ne débouchent pas encore sur des résultats réellement opérationnels, ni au niveau de l'élaboration des politiques publiques, ni a fortiori au niveau du gestionnaire forestier. Pour répondre à ces deux types d'attentes, il est nécessaire qu'il y ait un bon équilibre entre les recherches menées aux différents niveaux cités précédemment (de la forêt aux facteurs, du national au local). Les travaux de KOCH et JENSEN sont une bonne illustration des tentatives menées pour fournir des réponses au gestionnaire.

Sur le plan des méthodes, il existe une opposition forte entre des approches qualitatives menées sur des échantillons restreints et des approches quantitatives. Ces deux approches ne répondent pas aux mêmes questions (cf. JENSEN et KOCH), mais elles seront d'autant plus pertinentes qu'elles pourront être correctement articulées. Un effort méthodologique important est à faire dans ce domaine. Plusieurs travaux vont dans ce sens (BOERWINKEL, AXELSSON, LE FLOCH) mais doivent faire l'objet d'une confrontation notamment pour favoriser la comparabilité des résultats.

Par ailleurs, d'une façon générale, ces recherches intègrent très mal le facteur "temps" alors qu'elles sont confrontées à un phénomène qui évolue selon une double temporalité.

L'évolution des valeurs de la société peut être relativement rapide, alors que les répercussions des mesures décidées aujourd'hui sur la forêt se feront encore sentir sur de très longues périodes. Pour ne pas aboutir à un décalage avec les attentes futures, il est fondamental qu'une attention plus forte soit portée aux perspectives d'évolution des valeurs. Cela implique notamment de s'intéresser au rôle des groupes d'intérêt dans la construction des valeurs sociales.

Au delà de ces questions essentielles, l'article de O'LEARY et MAC CORMACK donne un inventaire des questions de méthodes auxquelles sont confrontées ces recherches.

2. Les attitudes des propriétaires

L'essentiel des recherches entreprises dans ce champ concerne l'impact des politiques publiques et plus particulièrement celles qui visent au reboisement des terres agricoles (cf. A.Ni. DHUBHAIN).

Ces travaux cherchent soit à constater le niveau d'adhésion de la population visée, soit à évaluer l'impact économique de ces mesures à différentes échelles (du ménage à la nation).

Mais il existe tout un champ de recherche à développer qui concerne d'une part le processus de décision des propriétaires (cf. LIFRAN), et d'autre part l'évaluation de leur consentement à recevoir pour mettre en œuvre ces politiques. Ces deux thèmes peuvent notamment être étudiés sur la base de modèles économiques qu'il serait intéressant de construire, et de valider à l'échelle européenne. Cette approche économique n'est cependant pas la seule, et elle doit pouvoir être confrontée avec une approche classique des motivations et des jeux des acteurs (cf. A. SELBY). La question du reboisement des terres agricoles reste à ce titre un enjeu majeur compte tenu des interactions avec la politique agricole commune et des répercussions sur la gestion de l'espace et le développement rural.

3. La négociation sociale

Les discussions ont par ailleurs surtout fait apparaître que la lacune majeure du dispositif de recherche se situait au niveau de la confrontation entre la demande sociale et l'attitude correspondante des propriétaires et des agriculteurs. Il existe certes quelques approches (cf. P. MAYER, C. NOUBLANCHE) mais qui restent encore très fragmentaires, et qui soulèvent parfois des controverses méthodologiques animées.

Ce constat a notamment conduit à la construction d'un projet de recherches européen basé sur des cas d'études locaux répartis en Europe. Mais il reste d'une part à organiser la confrontation méthodologique, et d'autre part à engager une réflexion sur l'étude des processus de négociation et sur les outils nécessaires. Cela implique notamment l'identification, la caractérisation et l'évaluation des fonctions non marchandes de la forêt. L'enjeu méthodologique se situe avant tout dans une meilleure articulation de l'identification des préférences qui relève d'approches sociologiques et de l'évaluation de ces fonctions, ce qui fait notamment appel à l'économie de l'environnement. Parmi ces fonctions, le paysage joue un rôle central en tant qu'intégrateur des relations non seulement esthétiques mais plus généralement affectives, de l'homme à son espace.

Par ailleurs, les perspectives d'organisation de la rétribution de ces fonctions restent un domaine complexe et à explorer. Des travaux sont à entreprendre concernant le niveau optimum d'organisation, les processus de négociation et de contractualisation entre acteurs, les flux financiers, le consentement à recevoir ou à payer des acteurs...

D'une façon plus générale, cela revient à poser la question de la "durabilité sociale" de la forêt dans le contexte du développement rural. Il y a là une question de fond, qui doit être approfondie pour éclairer les débats internationaux en cours.

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With a range of forests going from boreal to Mediterranean forest, Europe offers a wide forest diversity and varying management modes. The research projects undertaken on the relations between forest and society are in full development, but this field of research is still recent and raises many methodological questions. The projects on the public perception must be related to research projects on the attitudes of forest owners and on decision processes, in their patrimonial and economic dimensions.

In the framework of the COST working group on "Public perception and owners' attitude towards forest and sylviculture", this document presents 15 communications from European researchers.

The main topics tackled are:

- European public challenge about the forest landscape
- Environmental and economic aspects
- integration of non-commercial values
- attitudes of farmers and of the rural world
- reafforestation of agricultural lands
- public opinion, perception, preferences, and appropriation
- perception by local actors
- forests dedicated to leisure

Entre les forêts boréales et méditérranéennes, l'Europe présente une très grande diversité forestière et des modes de gestion variés. Les travaux de recherche sur les relations entre la forêt et la société sont en plein développement mais ce champ de recherche est encore récent et soulève de nombreux débats méthodologiques. Les travaux sur la perception du public doivent être associés à des travaux de recherche sur les attitudes des propriétaires forestiers et les processus de décision, dans leur dimensions patrimoniales et économiques.

Dans le cadre du groupe de travail COST, *"Perception publique et attitudes des propriétaires envers la forêt et la sylviculture"*, cet ouvrage présente 15 communications de chercheurs Européens.

Les principaux thèmes abordés sont :

- enjeu public européen concernant le paysage forestier
- aspects environnementaux et économiques
- intégration de valeurs non marchandes
- attitudes des agriculteurs et du monde rural
- reboisement des terres agricoles
- opinion publique, perception, préférences et appropriation
- perception par les acteurs locaux
- forêts consacrées à la récréation

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