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Conflict Cultures – Qualitative Comparative Analysis of Environmental Conflicts in Forestry

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Abstract

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Owing to the internationalisation of the forestry debate and forest policy, there is growing need to conduct comparative forest policy research at an international scale. This research compares environmental conflicts in forestry in seven cases during 1984–1995. The cases include Finland, France, Minnesota USA, Norway, Pacific Northwest USA, Sweden and West Germany. The research is based on the notion that each society has its own ‘cultural’ ways of producing and managing environmental conflicts in forestry, depending on the social, political, economic, and resource characteristics of the society. The purpose of the study is to describe these conflict cultures, to identify and analyse the societal aspects that impact them, and to discuss the implications of understanding conflicts as cultural phenomena. The research is based on focused interviews of multiple actors related to forest management and protection. For the data analysis, a ‘hermeneutic’ (interpretative and understanding) approach is introduced to Qualitative Comparative Analysis, the use of which has been dominated by causal applications. As a result of the analysis, models of conflict cultures and conflict management strategies are constructed. The model of conflict cultures indicates three basic dimensions of conflict culture, and defines how they are related to each other. These dimensions are mild vs. intense conflicts, separatist vs. co-operative relations between actors and stability vs. change in forest resource policy and use. The model of conflict management strategies indicates to what extent the different cases place emphasis on interactive vs. institutional conflict management, and the management of conflicting (sub)cultures within the society vs. the conflict culture of the society.

Keywords environmental conflict, forestry, culture, Qualitative Comparative Analysis, QCA method, hermeneutic interpretation, Finland, France, Minnesota, Norway, Pacific Northwest USA, Sweden, West Germany

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Preface and Acknowledgements

During the six years of work on this research, I have established a three-fold relationship with environmental conflicts in forestry. First, as a researcher, I have tried to do my best in studying the conflicts in a scientific manner. As a researcher, I have tried to make my research process and problems transparent, not hesitating to give interviews and talk about my work from the very beginning. The questions made by journalists, for example, have made me consider some aspects that may not have occurred to me otherwise. In addition, I have received valuable feedback from the readers of many of the articles published. Some may argue that openness during the research process could distract my objectivity. On the contrary, I feel that openness during the research process has helped me balance the subjectivity inevitably involved in any qualitative research.

Second, a conflict researcher who openly discusses her ideas is inevitably an actor in the policy debate. As such, I have learned that any statements made about sensitive issues like conflicts may easily create new ones. Although I do not wish to point out any particular conflicts, in some of the worst cases, only describing conflict rhetoric has led to being accused of taking sides and deliberately presenting information that would only promote the goals of one of the conflict partners. Such events, where the difference between conflict facts and rhetoric about conflicts tend to get blurred in the minds of the critics, are not only frustrating, but also very tough personal experiences. In these situations, I have found the words of Clifford Geertz (1973) particularly comforting. He regards cultural analysis as a science whose progress is marked “less by a perfection of consensus than by a refinement of debate”, and argues “what gets better is the precision with which we vex [agitate] each other”.

After having studied conflicts – and even created some – I also felt a need to do something about them. An opportunity to make use of my experiences was offered to me through the newly

established Forest Forum for Decision-Makers in Finland, which I have been leading since 1996. This brought about the third dimension that conflicts have in my life: conflict management and prevention. The Forest Forum for Decision-Makers is a discussion forum over forest issues, joining decision-makers throughout the Finnish society. Although I then took over totally other responsibilities than research, I have always received great understanding and support for my work from my new colleagues at the Finnish Forest Association.

This research was conducted in 1994–1999 as a joint effort of the European Forest Institute and the Finnish Forest Research Institute. In addition to funding provided by these two parent institutions, I am thankful for the financing from the Ministry of Agriculture and Forestry of Finland and the Maj and Tor Nessling Foundation.

As a researcher at the European Forest Institute, I thank Birger Solberg and Ian Hunter – former directors of the institute – for their encouragement to pursue my work on purely scientific lines, despite the pressure that occasional criticism against some details of my work might have raised. I would also like to thank Leena Roihuvuo, Minna Korhonen and Kirsi Loisa for secretarial help, editorial services and for keeping my accounts straight, and Tim Green for language editing.

During the project I also had the pleasure to work as an associate researcher at the Finnish Forest Research Institute under the instruction of professor Matti Palo by whom this project was initiated, and by director Aarne Reunala who had previously conducted research on the same issue. I would also like to thank Eila Iltanen and Margit Kuronen for accountancy and secretarial services. Moreover, the researchers at the Helsinki Research Centre were a constant source for inspiration during 1995–1996 when I had my office there.

The network of contacts and collaborators in such a project is enormous. I owe my special grat-

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This research is conducted as a PhD thesis at the Economic Department of the Faculty of Agriculture and Forestry at the University of Helsinki. This thesis belongs to the field of environmental economics and has been conducted under the supervision of acting professor Markku Turtiainen, and in the very late phases also his successor, professor Markku Ollikainen. In addition to my instructors and supervisors, I thank Pentti Hyttinen, Marjatta Hytönen, Pentti Luoma, Erkki Mäntymaa and Ville Ovaskainen for commenting upon the manuscript.

An important source of will and energy to complete this task has been brought to me by numerous colleagues who have regularly inquired about the progress of my work, and also commented upon many of the papers and reports produced during this project. It has made me feel that my work is important, and thus, kept me going.

Kati – my little sister – remember the day I brought up to you the need to understand the QCA method in a hermeneutic perspective? It was much because of your strength in the philosophy of social sciences that we were able to succeed with our effort. Heikki – my kid brother – many times you have been my saving angel. Owing to my confidence in your computer skills, I never recall having ‘wacked out’ even if I thought that I had just lost all data on my project. Anja and Pekka – Mom and Dad – my deepest thanks for your bottomless support and practical help that you have given during the long periods of work. Alec and Roy – my sons – many times I have been astonished by the scope of your understanding when Mom has spent so much of her time with someone else, Mr. ‘Väiski’, as we have called this project together. I know how hard it has been for you to accept Mom’s constant use of our home computer – loaded with interesting games – but now we are both fully at your disposal!

In Helsinki in January 2001,

Eeva Hellström

1 Introduction

1.1 Background and Motivation

Forests provide people with a number of physical and mental products and services. Many of them are more inclusive than exclusive of one another, but occasionally they also result in competition between different forms of forest use.

In the 1960s and 1970s, contradictions between wood production and other uses of forests reached such a magnitude that it attracted the interest of the public in many Western countries. The conflicts of this era have been found by Reunala (1986; summarised in Reunala and Heikinheimo 1987, and Hellström and Reunala 1995) to originate from simultaneous developments related to economic growth: growing demands for efficient forest management and wood production, growing standard of living and increased recreational pressure upon forests, and deterioration of the environment and fear for the exhaustion of natural resources.

Today, the environmental discussion about forestry is conducted in a setting where international questions have supplemented national ones as the issues of conflict, where the market sphere has challenged the policy sphere as an arena of conflict, and where new idealists have joined the chorus of old ones as participants of the conflicts. Accordingly, there is continuing need to update and deepen our understanding of the conflicts related to forestry. In particular, increasing internationalisation of the forestry dialogue and forest policy bring forth a need to understand forestry conflicts from comparative and cultural perspectives.

Cultural understanding of forestry conflicts in different circumstances is not meant to provide us with the means to control others. Instead, interpretations of the actions of others will enable us to place our own society in perspective (Rosenberg 1993, p. 21). Comparing our own conflict culture with that of others may offer us new insight that helps us understand the social and cultural construction of conflicts, and thus, help develop successful strategies for conflict managers.

At a practical level, a question that interests policymakers and motivates this research is: What attitude should be taken towards conflicts? For example, there is confusion on what constitutes a conflict let alone whether conflict is desirable. Conflicts are usually regarded as negative phenomena among the forest sector that has been 'attacked'. On the other hand, conflicts have been viewed as important 'tools' of many environmental NGOs (non-governmental organisations) by ensuring that the voices of various stakeholders are heard, and that new social demands are responded to.

According to Lehtinen (1994, p. 283–284), one of the central challenges of environmental research in the 1990s is the analysis of various actors and mechanisms affecting the structural change of society. Conflict and conflict management are examples of such, and thus of interest to policy analysts. Conflict management is also a major concern for various actors in the forestry debate, and brings us to the second practical question motivating this research: Should conflicts be managed, resolved, prevented or even promoted? Views on this question vary largely, if being asked from an environmental activist, a forest owner, a journalist, or a politician. Research can offer important insight on how to address forest resource conflicts. Here, an interesting question is, what type of conflicts and conflict management best contribute to policy development.

Understanding the role of conflicts in different societies is not only an issue of interest in policy making. Environmental conflicts may affect the image of businesses dependent on the use of natural resources. Since the 1990s, environmental conflicts in forestry have affected corporate decision-making related to forest management, product marketing, and even the location of production units and choice of co-operation partners. Subsequently, the third practical concern motivating this study is the growing demand for knowledge on how the appearance of conflicts is related to the severity of the ecological, social or economic problems involved.

1.2 Purpose and Definitions

For understanding the purpose of this study, it is important to make a distinction between two different terms: 'conflicting (sub)cultures' and 'conflict culture'. Conflicting (sub)cultures relates to situations where the cultural backgrounds of the conflict partners are different, to the extent of creating a conflict.

The second term 'conflict culture' relates to the general frame in which a certain society – with its typical social, political, economic and resource aspects – tends to create certain types of conflicts, and respond to them in a certain way. Anderson et al. (1997), for example, argue that natural resource conflicts tend to vary from culture to culture, as some societies avoid conflicts, while others will resort to physical violence to resolve them.

Whereas most conflict research aims at describing and analysing conflicting (sub)cultures within individual locally, temporally or substantially specific conflicts, this research focuses on comparing the conflict cultures of different societies. The difference between this research and the typical type of conflict research focusing on the group dynamics of one or few individual conflicts is like the difference between a more micro-level ethnographic study and a more macro-level anthropological study of cultural systems (see Geertz 1973, p. 21).

The research is based on the presumption that despite great variation in individual conflicts within any single society, different societies also have their own, cultural ways of 'producing' environmental conflicts in forestry, and responding to them, depending upon the social, policy, economic and natural resource characteristic of the societies. The purpose of this research is to investigate conflicts as cultural phenomena by:

1. describing the culture of environmental conflicts in forestry between 1984–1995 in Finland, France, Norway, Sweden, Minnesota and the Pacific Northwest region of USA, and West Germany, (for case selection see Section 1.3, and for case descriptions see Section 3.2),
2. identifying and analysing the major societal aspects that impact the conflict cultures of these cases (for identification see Section 2.2.2, and for analysis see Sections 4.2 and 4.3), and on this basis,

3. discussing the implications of understanding the origin and management of conflicts as cultural phenomena (see Section 5.2).

In addition to addressing the research problems presented above, an important product of this research is the development of a hermeneutic approach to the method of Qualitative Comparative Analysis (hereon, the word 'hermeneutic' is understood as interpretative and understanding, in contrast to the traditional causal application by Ragin (1987, 1994a)).

In this study, forestry is understood as human activity aiming at satisfying various needs through the use of forest resources (e.g. timber, non-wood products, biodiversity, stock and flows of carbon, landscape, recreation and tourism). Accordingly, forests are not only considered as an economic resource, but also as an environmental, social and cultural resource.

Conflicts within forestry are considered to include struggles related to how the forest resource shall be used (e.g. conflicts concerning forest management and preservation). Conflicts between forestry and the 'world outside' are considered to include struggles over land use (e.g. transforming forest into agricultural lands, construction, roads). This research focuses on conflicts within forestry, instead of conflicts between forestry and the world around it.

In this research, forestry conflicts are broadly viewed as struggles of varying intensity between interest groups, over values and issues related to forest policy and the use of forest resources. Such a broad definition is used because forest policy and the use of forest resources are affected by a wide variety of conflict types. Answering how different types of conflicts – both mild and intense ones – affect policies and resource uses is one aspect of interest to this study.

Defining whether a conflict is environmental or not is difficult. Conflicts over purely environmental issues are rare and most conflicts include a variety of issues and competing forms of forest use. In this research, it is not considered relevant whether the main issue of debate related to a specific conflict is purely or only partly environmental. A conflict becomes relevant for this study, if the environmental discourse related to the conflict is found to impact forest policies or forest uses.

1.3 Selection and Composition of Cases

A fundamental component in case study research is defining the unit of analysis, that is to say, what the 'case' is. In conflict research, for example, a case could be an individual (conflict actor), an event (individual conflict) or an entity (e.g. society), depending on the questions asked (see Yin 1994). In this research, a case represents the 'conflict culture' of a whole society examined, during the whole period of investigation (1984–1995).

In case study research, the cases can be selected so that they are estimated to produce similar outcomes (literal replication), or contradictory outcomes (theoretical replication), but for understandable reasons (Yin 1994, p. 46; Syrjälä and Numminen 1988, p. 12, 136, 142). The selection of cases in this study was a combination of both aspects.

Focusing the research on countries that share some similarities in resource structure and culture was considered to increase the feasibility of crossing cultural borders. Therefore, the research only focuses on Western societies with substantial forest resources. Moreover, understanding the conflict history of the societies to be investigated is an important basis for understanding the conflicts cultures of the present. Therefore, countries with sufficient and compatible scientific information available on conflicts of the past were preferred. For these reasons, Finland, France, Germany, Norway, Sweden and the USA were chosen as the countries to be investigated. In a desk study (Hellström 1996a), these cases were also found to represent a wide spectrum of different types of conflict, thus, opening up interesting possibilities for analysis and interpretation.

Substantial information was already available on the conflicts in these countries prior to 1983 (Reunala 1986; summarised in Reunala and Heikinheimo 1987, and Hellström and Reunala 1995). Therefore, it was considered appropriate for this study to begin with 1984, and to end in 1995 when the data was collected. The year 1984 is superficial in the way that it does not mark the beginning or end of any particular period of conflicts. For this reason, when investigating conflicts that were rooted to years prior to 1984, they were also understood from their historical perspective.

The desk study (Hellström 1996a) helped define the cases in more precision. It suggested that the differences of conflict cultures within Finland, Sweden and Norway were significantly smaller than the differences of conflict cultures between these countries. Many of the conflicts within these countries also took place within a national policy setting, and were affected by international market pressure. Accordingly, the cases of Finland, Sweden and Norway were considered to represent the whole societies of these countries.

France is a country with vast regional differences in ecology, geography, and the amount of forest resources. To some extent, this was also reflected in the variety of conflict themes that occurred in different regions. Yet, France as a whole was considered to form one case because the conflicts involved many national level organisations and common approaches to conflict management. Moreover, dividing France into several smaller cases would not have given credit to diversity itself, which proved to be an important characteristic of the French conflict culture.

The reunification of the two Germanies took place in the middle of the period investigated. The inclusion of the Eastern states would have produced a difficult research situation, where in East Germany, the societal characteristics relevant for this study would have been very different from all the rest of the cases, and where rapid societal transformation would have made the interpretation of conflict culture difficult. Even West Germany comprises states with vast differences in relation to resource structure and forest policy. In order to increase compatibility of the German case with the other ones, interviews were conducted in two states with substantial forest resources: Baden-Württemberg and Lower-Saxony. Because of substantial similarity of the conflicts in both states, they were still considered to form one case.

Owing to substantial regional differences, it was foreseen that the USA could not be considered to form one single case. Instead, two separate cases were selected: Minnesota and the Pacific Northwest region. These cases represent two extremes within the data, thus, broadening the spectrum of conflict cultures of the European cases in an interesting way.

Focusing on Minnesota as a state and not as part of a wider region was preferred, because the most substantial conflicts in Minnesota during the period investigated were related to state-level policy processes. The Pacific Northwest region was chosen because the conflicts within this region had been the most substantial ones within the USA during the period investigated. The whole region (comprising parts of Washington, Oregon and Northern California) was treated as one case. This is due to the fact that the resource characteristics related to the conflicts were rather similar throughout the region, and because policies related to these conflicts were more federal than state-specific.

It is also essential to recognise what the objects of analysis – the cases as conflict cultures – are composed of. Cultural analysis is not an experimental science in search of law but an interpretative one in search of meaning. Writings or discourses about conflicts are often interpretations in second or third order. Thus, they are fictions – not in the sense that they are false, but in the sense that they are something ‘made’ or ‘fashioned’ (see Geertz 1973, p. 15).

Being based on interview data, what is called data in this research is nothing more than the researcher’s own construction of other people’s construction of what they and their conflict partners have said or done in various conflict situations. As Geertz (1973, p. 16) puts it, such analysis is about “winks upon winks upon winks”. He also argues that there is nothing particularly wrong with this, and that it is inevitable in most cultural research where the line between the mode of representation and substantive content is difficult to draw.

1.4 Research Strategy and Process

In relation to the number of cases involved, many political scientists make a distinction between single and multiple case study strategies, and call the latter the ‘comparative case method’. Yin (1994), on the other hand, suggests that single and multiple case studies are basically two variants of one common case study strategy.

Comparative strategy is often interpreted differently in relation to qualitative and quantitative

methods. Alestalo (1992), for example, considers qualitative case-oriented and quantitative variable-oriented studies as the two basic types of comparative strategies. Furthermore, he suggests that strategies of case-oriented comparisons can be based on searching for differences and similarities, universals or variation.

Ragin (1994b) distinguishes ‘comparative research to study diversity’ as the third main research strategy in addition to ‘qualitative methods to study commonalties’ and ‘quantitative research to study covariation’. In conducting the comparisons of this research, focus is placed upon exploring diversity among the cases, rather than on searching for universal truths or similarities and differences. This is also the common strategy of the method of analysis used in this research, Qualitative Comparative Analysis (Ragin 1987, 1994a).

This research is based on Ragin’s (1994b) notion that social research is characterised by a constant interplay between ideas and evidence, as presented in the model of the social research process (Fig. 1). The strategy used in this research, and also the outline of this report, largely follow the logic of this model. In the following, the process of this research will be briefly described.

Ideas represent a “reservoir of theoretical ideas” that may be used to interpret the phenomenon to be examined (Ragin 1994b). From the reservoir of ideas, a holistic view on natural resources was selected as the main theoretical foundation for this research. Other important ideas included a constructionist view on culture, and understand-

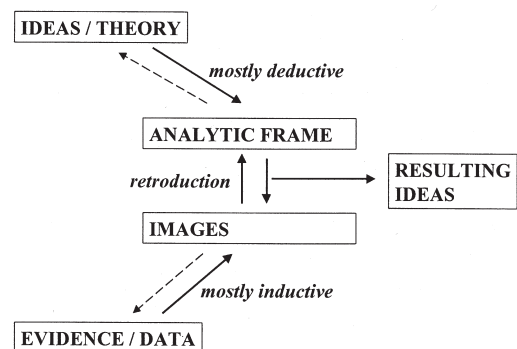


Fig. 1. The research process as an interaction of ideas and evidence according to Ragin (1994b).

ing conflict management from the point of view of conflict regulation theories (Section 2.1).

Ragin (1994b, p. 60–66) characterises analytic frames as conceptual tools, which “constitute ways of seeing”. They are constructed through interaction of theory and evidence (Fig. 1), and may be revised during the research process. Ragin (1994b) also points out that analytic frames have two components: When concepts are used to classify the phenomena, they frame by case. When concepts are used to characterise the cases, they frame by aspect.

Framing by case is largely about answering what the phenomena investigated is a case of. In this research, the case represents the conflict culture of the country, state or region investigated, as already identified in Section 1.3.

Framing by aspect is about specifying the key features that differentiate the cases in a broad category (Ragin 1994b, p. 63). In addition to descriptive approaches to conflicts and conflict management by a variety of conflict scholars (see Section 1.5), the construction of the analytic frame for this research was particularly influenced by a forestry related application of the holistic view of natural resources by Koch and Kennedy (1991) and by basic elements of forestry conflicts and the management of forestry conflicts identified by Walker and Daniels (1997) (Section 2.2.2).

Evidence illustrates the whole range of potential data (e.g. documentation, archives, records, interviews, observations, physical objects), from which ideas and analytic frames direct the researcher’s attention to specific types of evidence (Ragin 1994b). In order to focus the collection of data on the most relevant evidence, a desk study (Hellström 1996a) was conducted for guiding material collection. The data for each of the seven cases consists of about 30 focused interviews of specialists representing interest groups, businesses, administration, researchers and the media (a total of 211 for all the seven cases). (Section 3.1)

Images are the product of an effort to bring coherence to the data by relating it back to the ideas and frames that initially motivated its collection (Ragin 1994b). The interview data was organised separately for each country, according to the structure of the analytic frame and analysed by using hermeneutic text interpretation.

The images that were derived are described in individual country reports on France, Minnesota USA, Pacific Northwest USA, Sweden and West Germany (Hellström and Welp 1996; Hellström and Ryttilä 1998; Hellström and Vehmasto 2001) and in working documents on Finland and Norway (for summarised case descriptions, see Section 3.2).

Qualitative Comparative Analysis (QCA) (Ragin 1987, 1994a) was chosen as the method of analysis for comparing the cases. However, the fact that the method was traditionally used in causal analysis implied the development of a hermeneutic approach to the method (Rantala and Hellström 2001).

The analysis was constructed in two phases. First, the empirical typology approach to QCA was used to condense the categorised qualitative data and bring coherence to it. In the second phase, the condensed data was analysed by using the new hermeneutic approach to QCA. During the analysis with QCA, analytic frames, as well as the images were considered flexible. Thus, the idea of retrodution (see Fig. 1) – the combination of induction and deduction – was central to this phase of analysis (Section 4.1.1).

Although the research process is here described as a step-wise process, in reality, many of the phases overlapped to such a degree that the research process resulted in a constant interplay of ideas and evidence. This dialogue, conducted through systematic methods of analysis, culminated in social representations of environmental conflicts in forestry. The resulting ideas include, for example, the construction of models of conflict cultures and conflict management strategies (Section 5.2).

1.5 Research on Environmental Conflicts in Forestry

1.5.1 Scope of Studies

Environmental conflicts in forestry are often viewed as an important source of pressure for revisions of forest policy and forest management both nationally and internationally. Consequently, conflicts have been described and analysed all around the world.

In countries where forestry typically receives wide public attention, or where forestry conflicts have been intense, conflicts have interested many authors, journalists and researchers within and outside the forestry profession. In such cases, literature on environmental conflicts in forestry is abundant and the amount of data may even be overwhelming. Especially in the USA, there is a rich tradition of research on environmental conflicts, and aiming at developing conflict management techniques to concrete, practical conflict issues. In other countries with mild conflicts and little public attention on forestry, literature on environmental conflicts in forestry may be difficult to obtain.

Even a quick overview of conflict literature reveals that most conflict research has focused on an individual conflict or conflicts within one country (e.g. Lehtinen 1991; Löf 1993; Vail 1993; Yaffee 1994; see also articles in Solberg and Miina 1997 and Chandrasekharan 1997).

Floyd et al. (1996) have conducted a comparison of a few individual forest resource conflicts in the USA. Yet, comparative research on conflicts is relatively rare. In comparisons of several countries, the most typical approach seems to involve a comparison of only two countries (e.g. Kajala and Watson 1997; Sidaway 1997). Moreover, comparative conflict research is more leaned towards micro-level than macro-level investigation.

Forestry conflicts in several countries have only been presented in a few reports e.g. Banuri and Apffel Marglin 1993a; Lehtinen and Rannikko 1994; Reunala 1986, summarised in Reunala and Heikinheimo 1987, and Hellström and Reunala 1995). The proceedings of an international conference on conflict management and public participation (Solberg and Miina 1997) also reveal the rarity of international comparative research in this field.

Comparative conflict research is not usually conducted through the use of a specified comparative methodology or a common theoretical framework for the cases compared (Hellström 1997a). The existing approach to research on dispute resolution and public participation in forestry is claimed by Cubbage (1994) to typify the lack of a well-developed tradition of empirical analysis and theory building. Jeffers and Solberg (1997) also acknowledge the need to improve

the theoretical background for conflict resolution and public participation, and the development of comparative research, which explores the experiences from different countries and within different cultural contexts.

1.5.2 Views on Conflicts and Conflict Management

In defining conflicts, issues are typically attached into the notion of dispute, and values into the notion of conflict (e.g. Wondolleck 1988, p. 213; Crowfoot and Wondolleck 1990, p. 18; Burgess and Burgess 1994, p. 2). Myllyntaus (1994, p. 12–15) and Heijden et al. (1992, p. 4–6) offer a corresponding view. They state that disputes occur when the attempts to solve them affect the interests of various groups, and that conflicts occur when disputes drift outside settled social mechanisms. A broader review of scholars' definitions of conflict is provided by Walker and Daniels (1997, p. 15–16), who provide a list of terms used in defining conflicts: struggle, opposition, beliefs, tension, bargaining, dependency, incompatibility, competition, communication, strategic behaviour, and interaction.

Different types of conflicts are usually classified by intensity. Keltner (1990), for example, offers a wide spectrum of levels of intensity of struggles, from mild differences to litigation and physical confrontation. In addition to intensity, environmental conflicts may also vary according to the geographic scale of major actors (Kajala 1994, p. 6; Chandrasekharan 1997, p. 137–138; see also Fig. 6 on p. 42).

Turtiainen (1996, p. 5–9) offers a spectrum of definitions related to the management of environmental conflicts. Alternative dispute resolution includes all other ways of dispute resolution than judicial. Environmental dispute resolution involves negotiation in order to reach agreement. When a neutral arbitrator is used, the term environmental dispute mediation is used. Environmental dispute resolution is based on the idea that a conflict has already emerged. When the aim is to prevent conflicts from occurring, the terms conflict avoidance or conflict anticipation may be used. Conflict management may include either dispute resolution or conflict avoidance/

anticipation.

The range of techniques commonly used for settling disputes has been portrayed as a continuum extending from informal discussions, through forms of negotiation, arbitration and litigation to violent exchanges (Sidaway 1997, p. 290; Keltner 1990). According to Maguire and Boiney (1994, p. 31), conflict resolution can be enhanced by both qualitative techniques (communicative tools) for conflict resolution and by quantitative techniques for decisions under uncertainty (e.g. decision analysis).

A division has also been made between obligatory and voluntary measures. According to Ellefson (1992, p. 296–297), the task of conflict management is in many respects that of the established institutions of government (the legislatures, courts, and executive agencies), whereas Crowfoot and Wondolleck (1990, p. 19) emphasise more voluntary measures of dispute settlement (voluntary participation, face-to-face interaction, and agreement on the process to be used for settlement).

From an institutional point of view, Bostedt and Mattsson (1996, p. 1–2) have divided conflict resolution institutions within an existing framework of laws and regulations into adversative institutions (usually governmental or judicial) and co-operative institutions (negotiation groups or committees), and in democratic countries into the majority vote within the political law-making process.

Walker and Daniels (1997, p. 22) portray conflict management as a triangle of three inter-related dimensions: substance, procedure and relationship. They argue that any conflict situation includes all three dimensions, and one can address a conflict situation initially through any of the three dimensions.

Keltner (1990, p. 319–320) emphasises the need for understanding the nature of the struggles and the conditions under which disagreement escalates to destruction. This allows us to choose a strategy that is most likely to lead to a settlement. However, Burgess and Burgess (1994) point out that there are also circumstances where the possibility for environmental mediation is limited (e.g. intractable conflicts, or when a win/win solution cannot be created). Even then conflict management methods can be used to make

the confrontations more constructive and prevent their further escalation.

1.5.3 Societal Aspects of Conflict

A wide variety of theoretical approaches have been applied in conflict research in forestry. From a sociological point of view, the use of forest resources is primarily thought to depend on the values and interests of groups or societies. These interests may be substantive in nature, or they may refer to the process by which settlement is reached, or they may refer to the psychological means of the people in the conflict (Delli Priscoli 1997, p. 67–68; Walker and Daniels 1997, p. 18, 22).

Conflicts may also be viewed as culture-based, e.g. related to worldviews and identities (Anderson et al. 1997). They may reflect fundamental values, and even incompatible views of the relationship between people and the natural environment (Daniels and Walker 1997, p. 39). For these reasons, conflicts have often been recognised to involve strong emotional expressions, misunderstandings and stereotyping having, thus, a psychosocial dimension (Turtiainen 1996, p. 5). Particularly relationship conflicts are supposed to involve strong emotions, misperceptions, poor communication, and negative, repetitive behaviour (Delli Priscoli 1997, p. 67).

Regarding forestry conflicts, a political scientist may stress the policies and institutions guiding the use of forest resources. Bostedt and Mattsson (1996), for example, have conducted research on institutions for conflict resolution from the viewpoint of political science and jurisprudence. Also Kajala and Watson (1997) and Cabarle and Lynch (1997) have demonstrated the important impact that national legal systems and the public institutions with jurisdiction over forest resources have on the frequency, intensity and outcome of conflicts.

From a policy point of view, conflicts have usually been viewed as disagreement over what should be the determinants (criteria, bases, priorities) of a policy decision, a relationship, or some other issue of conflict (Walker and Daniels 1997, p. 18). Indeed, in relation to conflict research, many researchers (e.g. Wondolleck 1988; Banuri

and Apffel Marglin 1993b; Eckerberg 1990; Stjernqvist 1973) have stressed the importance of knowing how policy formulation and implementation processes operate.

The political context of the dispute has also been discussed in relation to the issue of power, which may affect the willingness of the parties involved to negotiate (Burgess and Burgess 1994, p. 7; Sidaway 1997). In particular, the sources of power in the conflicts have been found to include economic, symbolic, cultural and social resources, and the ability to mobilise the media (Joutsenvirta 1997). In fact, conflict research often focuses on the mass media, since it provides environmental groups a means of arousing public concern and challenging policy commitments (Cotgrove 1982, p. 12).

Economists tend to view the problem of the use of forest resources primarily as a question of the allocation of scarce resources. For example, Rhodes and Wilson (1995, p. 108–110) have constructed an economic model based on conflict curves within utility space that reflect Pareto-optimal allocations of land use services. Utility functions have also been used by Pykäläinen et al. (1999) in relation to participatory forest planning.

Conflict resolution has cost effects, originating from, for example bargaining or court trials. With the use of production possibility functions, Bostedt and Mattsson (1996, p. 1–2, 143) have demonstrated that an institution of conflict management, which is appropriate from the point of view of political science or jurisprudence, may not necessarily be appropriate from an economic point of view. Furthermore, Gifford and Stone (1975) have found that within a collaborative conflict resolution process, externalities are internalised within the group so that the socially optimal decision and allocation is achieved by merger and the optimisation of a joint utility function.

Conflicts have also been investigated from a

business point of view. Environmental NGOs have increasing power to negatively affect the companies' images and activities. Owing to conflicts, or fear of subsequent poor publicity, green alliances are in some companies seen as feasible, cost-effective long-term strategies (Joutsenvirta 1997).

From a resource aspect, Kajala and Watson (1997, p. 304, 309) have found both physical attributes and use patterns of forests as impacting, although not causing conflict. Based on a comparison of 12 cases, Floyd et al. (1996) have divided forestry conflicts into four types: conflicts over non-renewable (geo-commodity) or renewable (bio-commodity) resources, and conflicts over amenity use (e.g. outdoor recreation), and amenity preservation (e.g. maintenance of biodiversity).

In conflict literature, conflict over substance is often identified as one of the main causes of conflict (Delli Priscoli 1997, p. 67). Often, these 'cognitive' conflicts have been connected to lack of information, misinformation, different interpretations and views on the relevance of data (Turtiainen 1996, p. 5). Delli Priscoli (1997) has found that disputing parties often have different standards for evaluating information. What is rational from one perspective may be irrational from the other. In supplementing scientific knowledge, Castro and Ettenger (1997) have stressed the role of indigenous knowledge in dispute resolution. Cotgrove (1982, p. 34) has noted that different views to information sometimes stimulates a moral indignation, which justifies action crossing the threshold of legality. Significant uncertainty may also exist over the consequences, boundaries and reversibility of environmental problems (Turtiainen 1996, p. 5). This may be used to politicise science by the parties involved, in order to build their cases (Rhodes and Wilson 1995, p. 119).

2 Theoretical and Analytic Frames

2.1 Theoretical Ideas

Litmanen (1996, p. 533–534) suggests that social theories that might be applicable to the study of environmental conflicts include social constructionist theory (e.g. Hannigan 1995), neo-Weberian theory (e.g. Freudenburg 1993, Perrow 1984), modernisation theories (e.g. Giddens 1990, 1992), systems theory (e.g. Luhmann 1989; Litmanen et al. 1994) and theories of risk society (e.g. Beck 1992; Perrow 1984). According to Turtiainen (1996), environmental conflicts may also be viewed from the point of view of critical planning theory, whereas Maguire and Boiney (1994) have relied on decision-analysis.

From the reservoir of theoretical ideas that may be used to interpret the phenomenon investigated, choices that guide the construction of the analytic frame have to be made (see Fig. 1 on p. 10). This research is mostly based on ideas derived from a holistic view on natural resources, social constructionist theory and conflict regulation theory. These theories largely define how forest resources, conflicts and conflict management are understood in relation to society.

According to the holistic view, natural resources can be viewed not only as attributes of the physical environment, but as attributes of the economic, political, social and cultural order as well. In fact, there exist congruence between the concept of ‘resource system’ and the concept of ‘social system’ (Lively and Preiss 1957, p. 227; Firey 1990, p. 17; Lee et al. 1990a, p. ix, 1990b, p. 10; Hahtola 1990). The definitions of what constitutes a resource may also change over time in response to technological advancement and emerging values (Lively and Preiss 1957).

The holistic view on natural resources was independently formulated by Mukerjee (1926) and Vance (1929) in the 1920s (Firey 1990, p. 15–16), and has since been widely applied. The holistic view on natural resources has recently also been adopted by several forest policy analysts (e.g. Koch and Kennedy 1991, p. 332; Glück

1987; Kennedy 1985), only with more precision on the various systems related to the use of forest resources.

The adoption of a holistic view on natural resources implies that problems related to their use cannot in reality be separated into sociological, political, economic, or physical ones, but are characterised as complex wholes. Thereby, an analytic frame for investigating conflict cultures should simultaneously view the phenomenon from multiple aspects. This is the first important foundation of the analytic frames constructed in the following section (Section 2.2). Because of the multitude of aspects to be investigated in cultural research it can, according to Alasuutari (1995, p. 24), even be said to be cross-disciplinary or even anti-disciplinary.

From a constructionist perspective, social problems are not static or objective conditions, but develop on the basis of collective definitions (Hannigan 1995, p. 32). Environmental issues, for example, are not viewed to cause a large social reaction as such, but only when people recognise environmental effects and interpret them as serious problems. Thus, constructionist analysis is concerned with how people assign meaning to their world.

Strict constructionists have been accused by critical realists of denying the existence of serious ‘real-life problems’ (Hannigan 1995, p. 32–34). Indeed, strict constructionism is as problematic for this study as strict functionalism, which, on the contrary, assumes the existence of social problems (e.g. conflicts) as products of only objective conditions. Therefore, the line of thought underlying this research largely parallels to the view of Rosenberg (1995, p. 101), according to whom, claiming that social institutions are constructed means roughly that they do not exist independent of people’s actions, beliefs and desires.

A conflict is not viewed as a product of objective environmental problems, but of the various meanings that people accord to them. In the analytic frames (Section 2.2), this is highlighted by

the fact that conflicts are not only viewed as phenomena constituting of conflict actors and their actions, but also of images of the conflicts. This setting implies a pluralistic view of social reality: interpretations of objectively perceived situations vary for personal, historical and cultural reasons (Leskinen 1994, p. 17–20; Hahtola 1990, p. 275–276).

The emphasis given to the importance of assigning meanings in cultural studies (e.g. Alasuutari 1995, p. 24–27) implies that cultural reality can be viewed as socially constructed. In a similar way, not only conflicts, but also conflict cultures can be viewed as socially constructed phenomena.

Reflexive in one sense means that the dissemination of a social theory can have an impact on its subject (Rosenberg 1995, p. 115–116). For example, research results on conflict culture may initiate change in such culture. In this sense, even this research can be regarded as reflexive and as part of social discourse (see preface and Section 5.2.3). Reflexivity has another dimension, too. According to critical theorists, social science is not free from value commitments. Accordingly, it is considered to have a moral dimension. Rosenberg (1995, p. 116–118) notes that social science does not always merely describe the way the world is, but provides guidance about the way the world ought to be. In this research, moral commitments are mostly related to the issue of conflict management, and how it is understood in relation to social development.

According to Leskinen (1994, p. 21–22), social theory offers three main views on conflicts and societal transformation. According to consensus theories, social conflicts are temporary disturbances, which the society corrects through self-regulating processes. Conflict theories, on the other hand, consider conflicts as inevitable and as the prime source of mobilisation of social change. Finally, theories of conflict regulation constitute attempts to produce a synthesis between consensus and conflict theories.

According to Turtiainen (1996, p. 21), any theories on conflict management are inevitably based on the perspective of regulated conflicts. Indeed, most conflict management theories are based on the perspective of a potentially positive role of conflicts in social development. For exam-

ple, conflicts are viewed to keep public authorities alert, increase awareness of problems, help define issues, promote checks and balances in agency decision-making, motivate and encourage creative solutions to problems, enhance moral and cohesion, stipulate creativity, and ensure that the many interests at stake will be heard (Coser 1956; Wondolleck 1988, p. 2; Tjosvold 1984, p. 122–123). Environmental conflict can be productive and useful, depending on how it is managed or contained (Tjosvold 1984, p. 121–122). The potentially positive role of conflicts in social development can be realised through multiple processes (Hellström 1996b, 1998b, see also following Section).

The approach used in this study resembles conflict regulation theories. A distinction is made between the existence of conflicts as a general social phenomenon and the occurrence of time, issue or place specific individual conflicts. Although some form of conflict may be viewed as existing inevitably at all times, societal circumstances and the activities of various actors may have significant impact on conflict culture (e.g. what type of conflicts emerge, and when, where and how they occur).

2.2 Analytic Frames

2.2.1 Analytic Frame for Data Collection

The conceptual tools used to guide material collection and analysis – the analytic frames – are a pragmatic product of interaction of theory and evidence (see Fig. 1 on p. 10). Analytic frames are not indefinite, but they are revised and refined throughout the research process. In the following, the analytic frames for this research are described, as they were understood during data collection (see below) and during analysis of the data (Section 2.2.2).

In the analytic frame for data collection (Fig. 2), forestry conflicts and the images of such are considered to have a central role in the interplay of values, policies, markets and resources. Some of these aspects are illustrated in the following (for more detailed description, see Hellström 1996b; Hellström and Welp 1996; Hellström and Ryttilä 1998; Hellström and Vehmasto 2001).

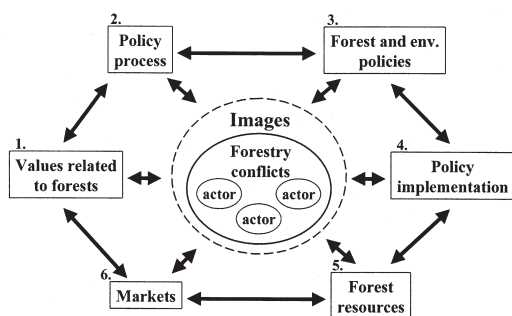


Fig. 2. Analytic frame for data collection.

1. Values related to forests. The values of the public have considerable effect on what issues can be raised to the public agenda by the mass media. Such widespread mediation of forestry conflicts as most Western countries have faced during recent years could not have been possible if this agenda setting was not supported by the values of the public. Vice versa, the mediation of forestry conflicts as well as other campaigning of forestry issues affects the values and attitudes of the public by giving impressions of the prevailing value structure of the society. Often, it is this impression of social values rather than the factual social values prevailing in society that is of most importance to political and economic decision-making.

2. *Policy formation.* The participation of relevant interests in the policy process may be of official or unofficial nature. Limited 'official' representation of interests may be due to, for example, power structures and traditions in the political culture. However, not all interest groups wish to participate in the 'official' policy process, but may even have more influence as unofficial pressure groups. The publicity of the activities of environmental organisations in the media, and their growing support and resource base increase their political power, which again facilitates the integration of their participation into the political culture.

3. *Forest and environmental policy.* When a particular policy has been proven successful in the prevailing conditions of society, the policy may often become 'internalised', so that policy change is actualised only after the symptoms caused by the incompatibility of the policy and

changing circumstances grow intolerable. The policy issues under debate in forestry conflicts are characterised by this incompatibility, and thus, also initiate policy change. In fact, there always exists some delay between societal change and policy change. The emergence of conflicts often shortens this delay.

4. *Policy implementation.* If there is disagreement over policy goals, conflicts may emerge to obstruct the implementation of a disputed policy. Even if there exists agreement between interest groups on policy goals and instruments, the implementation of a policy does not necessarily reflect such underlying goals, owing to, for example, the attitudes of the implementers, technological and economic constraints, or pressures from various interest groups opposing the policy. In such cases, environmental organisations may attempt to promote the implementation of the policy by raising public attention to the issue, and even challenge the implementation of the policy by raising legal suits against the implementers.

5. *Markets and economic activity.* If the market mechanism functions perfectly, the use of forest resources is a reflection of the values of the society at large. However, many environmental benefits – despite their high social value – are not exchanged in markets. Yet, markets for such benefits can to some extent be created through policy measures. Conflicts may also arise that impact market structures and processes. For example, non-market values of environmental benefits can be attached to the market values of marketable products. The satisfaction of environmental values by the producer increases the marketability of a product, whereas the dissatisfaction of environmental values by the producer decreases the marketability of the product.

6. *Forest resources.* The utilisation of forest resources is usually a core issue of environmental conflicts in forestry. Many conflicts are initiated by a disputed forest management action taken in a specific locality, and the arising conflicts may have a direct impact on forestry operations in the locality in question. Even in conflicts that are not site-specific, the characteristics of the emerging conflicts are significantly affected by the structure and traditions of forest utilisation in the society involved.

The frame illustrated (Fig. 2) was not final nor fixed but provided ideas that could be used to guide the construction of the interview protocol (Appendix 2), and to structure the country descriptions (summarised in Section 3.2, for details on some of the cases, see Hellström and Welp 1996; Hellström and Ryttilä 1998; Hellström and Vehmasto 2001).

2.2.2 Analytic Frame for Data Analysis

During the comparative analysis, when moving between the data, the categorisations that were constructed from it, and the ideas that resulted from initial rounds of analyses, a need to revise the analytic frame became obvious. For example, the policy sphere of the analytic frame was too dominant in relation to other aspects of the analytic frame. This resulted in a revised analytic frame for data analysis.

Koch and Kennedy (1991) argue that systems originating and communicating social values related to forests include the social system, the political system, the economic system, and the natural resource system. Conflicts and the management of conflicts can be viewed as forms of communicating social values, and thus, they are strongly related to the social, political, economic and resource aspects of society. The importance of all these viewpoints in conflict research is reflected in the review of literature on the societal aspects of conflicts (Section 1.5.3).

The analytic frame is based on descriptive aspects of the conflicts and conflict management, and societal aspects of the conflicts. Ideas for the first (descriptive aspects) were largely derived from the literature review (Section 1.5.2), whereas ideas for the latter (societal aspects) were largely derived from Koch and Kennedy (1991), and supplemented with ideas from the literature review (Section 1.5.3).

Accordingly, the aspects of conflicts to be analysed include:

Descriptive aspects:

1. The types of conflict; and
2. approaches to conflict management.

Societal aspects:

3. The social aspects of conflicts;
4. the political aspects of conflicts;
5. the economic aspects of conflicts; and
6. the environmental/natural resource aspects of conflicts.

Walkers and Daniels (1997, p. 22) portray the origin of conflicts and conflict management as a triangle of three interrelated dimensions: substance, procedure and relationship. They argue that any conflict situation includes all three dimensions, and one can address a conflict situation initially through any of the three dimensions. Recognising these three dimensions, each of the six aspects of conflicts listed above are investigated from the point of view of substance, relations and processes, to the extent made possible by the data (Fig. 3).

The analytic frame for data analysis offers a basis for describing and categorising the data (see Sections 3.1.2 and 4.1.2). It cannot offer direct guidance for defining any single categories, though. It only points out the potential directions for the researcher, in order to ensure that the categorisation of data takes place within a setting that is relevant for the research problem, and in a broad enough way to cover the scope of interest in this study. Compared with the initial analytic frame (Section 2.2.1), the revised analytic frame brings more structure to final categorisation and analysis, but it does not abandon any of the elements or aspects that are central to the initial analytic frame for data collection.

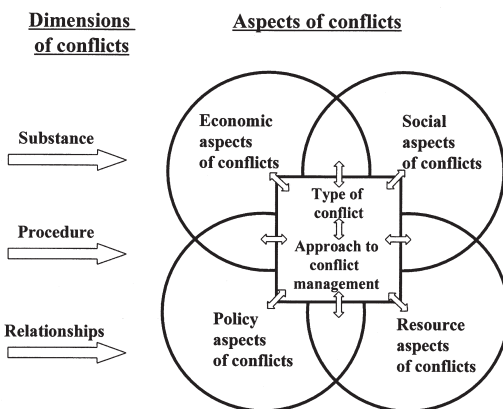


Fig. 3. Analytic frame for data analysis.

3 Data and Case Descriptions

3.1 From Evidence to Images

3.1.1 Interviews in the Research Process

Focused interviews are used as the primary source of data. They are semi-standardised, and in many respects, they are a combination of structured and open interviews. Focused interviews are based on knowledge that the interviewees have experienced the same kind of phenomenon, and on the fact that the researcher has studied the basic structures and processes of the phenomenon in advance. Subsequently, the researcher has reached some assumptions, based on which she prepares an interview protocol (Hirsijärvi and Hurme 1991).

In focused interviews, predefined general themes are operationalised into questions during the interviews both by the interviewer and the interviewee. This allows for the interviewees to react freely to the themes, enabling views that would otherwise be inaccessible to the researcher to be revealed. Like open interviews, focused interviews are sensible to the personal characteristics of the interviewers. Yet, predefined themes increase the compatibility of the interviews.

The interview process of this research is presented in Fig. 4. On the basis of a tentative analytic framework (Section 2.1) and a desk

study (Hellström 1996a), assumptions on the major phenomena relevant to the research problem were made. This knowledge was compiled into an interview protocol (Appendix 2). The major themes of the protocol corresponded to the elements of the tentative analytic frame (Fig. 3 on p. 18). For ensuring compatibility between cases, similar interview protocols were used for each case. The difficulty in formulating the interview protocol was to keep it general enough to fit the different circumstances of seven cases, but still make it detailed enough to help the interviewer in question formulation.

The interview protocol formed a basis for question formulation during the interviews. The questions asked included both fact-finding and opinion questions. The interviews followed the protocol in relation to the themes to be discussed, but freedom was also given to the interviewer to formulate questions in accordance to the relevance of each issue to the specific interview situation. It was not expected that all interviewees could be experts in all the listed themes. Neither did all questions have relevance for all interviewees. In a few cases, the interviewees were not even willing to discuss a certain theme. Although, as a whole, the interviews cover the whole range of themes in the interview protocol, they do not include the opinions of all interviewees on all issues or themes. Moreover, the interviewers were given some freedom to follow new clues ‘outside the interview protocol’ that might emerge during the interview.

Lists of interviewees were prepared by local contact persons who had familiarised themselves with the research project. Rather than having a high position in their organisation, the interviewees were expected to be active and informative in discussions, and have a good overview of the conflict situation in their country. In most cases, the interviewees were chosen because of their experience from the whole period of investigation. However, within the environmental movement, some young people were also interviewed who

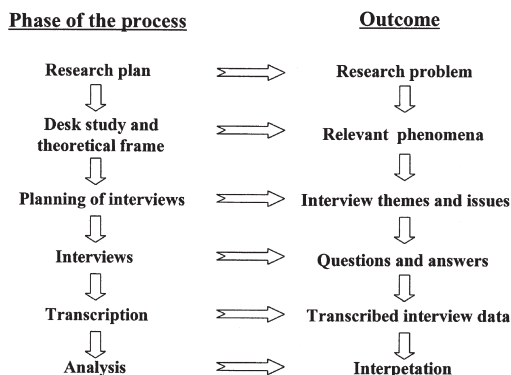


Fig. 4. Interview process and its outcomes.

had not been active in the forestry debate during the whole period. Even though most interviewees represented national level organisations, some representatives of local organisations or special campaign organisations were interviewed if they had particular relevance to conflicts. Although the final composition of interviewees varied slightly according to local circumstances, the main groups of interviewees included:

- research (mainly forest policy researchers);
- the media (forestry, environmental);
- environmental movement (local, national and international organisations);
- environmental administration (regional, national);
- forestry administration (private and public forests, regional and national);
- forest owners (national unions and local forms of common ownership);
- forest industry (companies and national federations);
- other relevant interests (recreation, hunting, reindeer herding, etc.).

The total amount of interviews conducted was 211 (Table 1). Owing to the high amount of interviews, four different persons conducted them. This was also a necessity because the job required previous knowledge of local circumstances and good language skills.

The role of the interviews in the data collection process was two-fold. They were used as key informants, but they were also asked to point out additional supportive written material on the themes that were discussed. The use of several sources of evidence is also supported by the principle of triangulation, which is generally recommended for case study research. A conclusion is likely to be more convincing and accurate, if it is based on several different sources of information (Yin 1994).

The interview data consists of more than 300 hours of recorded interviews conducted in six different languages. Transcribing this data first carefully – word for word – and then translating it to English – word for word – would have been an enormous task, resources for which were not available. By the time that the tapes were transcribed, the interviewer had already formed a preliminary image and understanding of the data, as an interaction of the data (interviews) and

Table 1. Number of interviews conducted.

Case	Number of interviews
Finland	35
France	31
Germany	34
Norway	28
Sweden	28
USA	
– Washington DC	12
– Minnesota	24
– Pacific Northwest	19
Total	211

the analytic frame. During the transcription, this knowledge was used to select the major arguments which were only translated into English. Even these summaries of interviews consist of about 700 pages of condensed text.

Thereafter, only the texts transcribed from the interviews through an interpretative process could be relied upon. From these transcripts, the tone of speech was gone and even some of the initial wordings used. It was no longer possible to ask the informants what they meant by saying something. Although, in principle, the researchers could still ask themselves what they had meant by transcribing a statement the way they had (by re-listening to the tapes), it was too laborious to do it very often.

3.1.2 Forming the Images

In Section 1.4, images were defined as the product of an effort to bring coherence to the data by relating it back to the ideas and frames that initially motivated its collection. The following section (Section 3.2) describes the images of environmental conflicts in forestry separately for each case. Below, the process of forming these images from the basis of the transcribed texts is described.

For interpretation, a structural analysis was made by organising and condensing the interview texts according to the structure of the analytic frame. This process was not only inductive (see Fig. 1 on p. 10: from data to images), but also involved of a process of moving from entities to parts, in some occasions, returning even back to

re-listening a few interview tapes. Accordingly, the process of text interpretation was based on the dialectics of explanation and understanding (see Ricoeur 1991 and Rantala 1996).

As a result of the interaction of these processes of understanding (interpreting the texts) and explanation (structural analysis), case descriptions were written. In doing this, written material was used to fill in gaps in the interviews like years, figures and other facts. To a minor extent, literature was used to support, construct and develop the understanding of the cases. This process resulted in case reports for France, Minnesota USA, Pacific Northwest USA, Sweden and West Germany (Hellström and Welp 1996; Hellström and Ryttilä 1998; Hellström and Vehmasto 2001) and corresponding working documents for Finland and Norway.

Two important distinctions have to be made between the descriptions presented in the case reports and the images presented in the following section (Section 3.2).

First, in the case reports, a wide range of original data (interviews and literature) is presented, whereas the case descriptions presented here are based on interpretation (images) of the data. For example, to say “within the conflict culture of case A, significant emphasis is placed on substance oriented conflict management” is not a statement by any of the interviewees or derived from literature, but an interpretation made by the researcher. It may be based, for example, on the fact that several interviewees stressed the importance of informing the general public about ‘forestry facts’, or finding proof against the arguments of the opponents as a dominant approach to conflict management, and that this approach was also reflected in an excessive number of information campaigns or production of information material.

Secondly, the case reports describe the cases as separate from all the others, whereas the images presented here have been affected by comparison of the cases. For example, the claim “conflict management in case A is substance oriented to a significant degree” implies an understanding of what is meant by ‘significant’. This, again, implies that the case is viewed in relation to the other cases. The relativity of the categorisations means that the images had to be open to changes

during the comparative analysis.

The images presented in the following section can largely be viewed as descriptions and background information on the final categorisations used in the QCA analysis (see Appendix 3 and tables 1A–1F in Appendix 5) in relation to each case (for the process of constructing the categories, see Section 4.1.2). Because the relevancy of each category to each case varies, only some of the most important categories are referred to in the text presented in the following section.

It should also be noted that the descriptions presented in the following section are an image built upon the rhetoric used by the interviewees, and every detail should not be considered to represent objective ‘facts’ of the conflicts within these cases.

3.2 Images of the Cases

3.2.1 Finland

Forests are the dominating landscape in Finland more than in any other European country, and the amount of forest resources per inhabitant is high (m1) (for description of the category see Appendix 3 and Tables 1A–1F in Appendix 5). Owing to very long traditions of forest use (f1), practically all forests in Finland have been affected by man. Yet, particularly in northeastern and eastern parts of Finland, old-growth forests with high natural values are claimed to remain (m2). Forests in Finland are mainly semi-natural. Reforestation is typically conducted with tree species natural for the site. Owing to the natural conditions of the boreal forest zone, an even-aged management system has been adopted (m5), with regular thinning, and the use of either clear-cuts and planting or natural regeneration.

After a few peaceful years in the early 1980s, environmental conflicts in forestry in Finland intensified again in the mid-1980s. They included frequent well-publicised on-site protests (a1) where environmentalists tried to prevent the logging of wilderness areas and old-growth forests (e.g. Kessi, Talaskangas, Kuusamo) through direct action. The physical nature of the conflicts (b1) was strengthened by the involvement of the police particularly in the earlier conflicts (p1).

For the most, these conflicts involved public forests managed by the Forest and Park Service and were, thus, also related to the debate on the role of public forestry (a5). In 1994, private forestry also became strongly involved in the protection debate (d4), beginning from on-site protests that occurred in the forests owned by the Kuusamo Forest Common, a vast forest area owned jointly by a large proportion of the local population. As a whole, the issue of protecting wilderness and old-growth forests grew into a polarised struggle between environmental interests and local communities in northeastern and eastern Finland. Within this struggle, the employment and livelihood aspects of increased forest protection, and its impacts on the livelihood of local communities became a major issue of debate (a3, d3, o4).

As a result of work in the Wilderness Committee and others, the already substantial amount of protected forests (m3) has significantly increased in Finland (n1) through multiple forest protection programmes (g3). However, conflict over the implementation of the plans for forest protection continued (h5), as insufficient resources were available. Accordingly, the main focus on forest protection conflicts has been on increasing the amount of protection areas, not on the management of old already established protection areas or parks (m4).

A feature very specific for Finland in the 1980s was the existence of frequent litigation raised by forest authorities against forest owners, in order to more effectively implement the wood-production oriented private forestry legislation (g1, g4, h5). This litigation was indirectly related to environmental aspects of forestry (b2, e5), but the conflicts gave space for more flexible later interpretation of the forestry legislation, also regarding environmental consideration in forestry. Although forest protection was the major issue of debate, considerable pressure to develop more environmentally aware forest management practices (g5) also existed.

In particular, forest management issues involved the use of clear-cuts in regeneration. Harvest levels slightly fluctuated during the period, but the rise of the harvest level was modest compared to, for example the two cases from the USA, and it was not a major issue of debate (n4). The

level of harvest was only discussed in relation to a fear of increased forest protection, not as an issue as such (a2). As practically all forests in Finland are economically accessible for logging, any intensification of conflicts during economic conjunctures was not recognised. Neither did the conflicts seem to be related to the profitability of forestry (k4) in other respects than the increase of subsidies available for increased environmental consideration.

Environmental conflicts in forestry in Finland mainly involved a debate between environmental and economic interests. The rather limited markets for non-wood products or the relations of forestry with the indigenous population (the Sami), did not raise extensive environmental conflict potential (j5, o2, o3). In Finland, public access and public rights are extensive (o1). It is surprising how little focus was placed upon multiple-use issues, despite the importance of forests as a source of recreation for the Finns (a4, d5). This was also reflected in the limited involvement of other organised interests than forestry or environmental in the conflicts (c5). Subsequently, industrial roundwood has had a dominant role in the forestry conflicts in Finland (j3).

Among the major conflict parties, the existence of a co-operative approach (e2, f2) or open value discussion (e1, r2) between the conflict parties was not brought forth in the interviews. Factors that also indicate a slight polarisation of relationships between the forestry and environmental sectors include the lack of environmentally oriented professional forestry organisations (f3), little mixing of different professions within the forestry organisations (f4, r4), and the rise of organised counter movements (e.g. the Heidelberg Society) against increased environmental pressure (f5). Conflict partners relied on trying to influence each other more through action than discussion (b4). In addition to the overall importance of forestry in Finland (d2), such conflict action was a source for lasting media attention (c4). For example, on-site protests raised intense public debate at local, regional and national levels and even occasional articles in the media of the major customer countries of the Finnish forest industries. This also made the media (e3) and international customers of the forest industry (c1) important actors in the debate.

During the early 1990s, policy-making and planning processes were strengthened as channels for communication of environmental values (e4). The Forest and Park Service began to include public participation in its forest management planning processes (h2, i4), and also the initiation of a major legislative review (h1) provided a new arena and institutional setting for value communication. Large-scale policy revisions were enabled by the fact that the relationship between the forest and environmental administrations was not a source of significant conflicts, nor were the administrations strongly involved as conflict parties (c3). Instead, particularly in the early 1990s, the administrations worked in close co-operation (i2) in setting new directions for forestry in Finland (e.g. joint environmental programme in forestry in 1994). By the end of the period of investigation, the legislation concerning the Forest and Park Service was revised (n2), and profound revisions of the Forest Act and the Nature Conservation Act were initiated (g2, h1). Furthermore, in the early 1990s, subsidies for forestry were revised in the direction of increased environmental consideration (h3), and new guidelines promoted environmentally adapted clear-cut techniques and mixed forests (h1). During these processes, multiple stakeholders were generally invited to participate (i3, q3). On the other hand, party politics was not a major arena for forestry struggle (i1), and scientists were mainly accorded the role of advisors and not participants in the policy processes (i5).

Although individual environmentalists have been very active internationally, the environmental movement in Finland has traditionally been rather isolated from international developments. For example, the establishment of a national office of Greenpeace in Finland in 1989 filled in a clear gap within the previously nationally oriented and rather heterogeneous environmental movement (d1), bringing about a more general change in the methods used by the environmental NGOs. The environmental movement treated many of the forests where on-site struggles occurred in the early 1990s as 'hotspots' in attempts to raise pressure for saving them (l2). Subsequently, the intense conflicts over the protection of old-growth forests had significant impacts on both wood markets and the markets of forest products. Although

research findings were not known to exist indicating that wood prices were affected by the conflicts to any degree (k2), the demand for wood from disputed areas was claimed to have decreased in some regions (k1). Owing to the conflicts, there was no market access for all wood that was harvested, even with the permission of the environmental authorities. In the forest products markets, instead of price effects, the customers had begun to demand the verification of an acceptable origin of wood (k3).

Finland is among the leading export countries of forest industry products (d2, j2). A large proportion of this export goes to Central European countries with environmentally sensitive markets (j1), where environmental demands were frequently expressed by customers of the forest industry (publishing houses, retail store chains, etc.). Subsequently, the forest industry was also strongly involved in the conflicts, which internationalised rapidly in the early 1990s. On the one hand, the industry feared a decrease of the harvestable wood supply, induced by potentially increased forest protection. On the other hand, the industry was concerned about its environmental reputation among its international customers who became increasingly interested in the origin of wood used in forest products sold at the international markets. Furthermore, the forest industry was involved in the forestry debate as being a forest owner itself (c2, j4). In order to secure market access, the forest sector campaigned strongly for the image of Finnish forestry (e.g. PlusForest campaign) (b3, l1). Although the debate about forest certification had begun in Finland prior to 1995, suspicions against certification were widely expressed among the forest sector (l3) and the possibility of large-scale certification was not discussed in a serious manner (l4, q5).

Conflict management in Finland was very action-oriented and practical, but focused little on improving communication between the actors. Authoritarian conflict management (e.g. police involvement and conflict resolution by official authoritarian committees) was frequently used (p1). Moreover, the importance of substance and 'facts' in conflict management strategies is illustrated in strong image campaigning by the forest sector (p5). Yet, substantial issues were used more as means of legitimisation than as means of con-

flict resolution through joint problem solving or involvement of the scientific community (p2).

On the other hand, conflict management also involved significant changes both in forestry policies (p3, q4) and practices (p4). In the early 1990s, voluntary environmental forest management guidelines were given by most forestry organisations, resulting in substantial change in forestry practices (n3). Overall, the conflict related to forest management was managed through changing forest management policies and practices by each actor separately without, for example, extensive joint educational campaigns of the forest sector (h4, r5).

In contrast to action-oriented conflict management, little effort was placed upon improving relations through co-operation (r3) or voluntary conflict arbitration (r1). Instead, official conflict resolution committees (q1) were established to resolve the major conflicts (e.g. Nuuksio Committee and Kuusamo Committee). One exception to the more institutional approach to conflict management was the launching of public participation in forest management planning by the Forest and Park Service (q2).

3.2.2 France

Although having some densely forested regions, the French landscape in general is not dominated by forests (m1). All forests are touched by man and shaped by culture and traditions. Unprotected old-growth forests were not claimed to exist (a1, a3, m2). Owing to ecological and cultural variation, forest management regimes comprise many forms from coppice forestry to uneven-aged management and monocultures of tree species not natural for the site (m5).

Conflicts in France were mostly local, with great variation in themes and intensity and only few issues of strong interest at the national level. This is rather natural in the conditions of large regional variation in ecology and culture. During the 1980s, and early 1990s, most environmental conflicts in forestry in France remained at the level of campaigning (b3) and heated public debate (b4) in the local and regional press (c4, e3). Intense conflicts, including on-site protests or litigation were rare (b1, b2). Conflicts focused

on public as well as private forests, urban forest as well as parks and protection areas.

In regard to public forests managed by the Forest Service (ONF), rather than the general role of public forestry (a5), or the level of harvest of forest utilisation (a2, n4), individual forest management practices caused concern. For example, the construction of logging roads in remote mountainous regions raised concern over the disappearance of many threatened species (e.g. brown bear and wood grouse). Within forest management, particularly clear-cutting and the choice of species in afforestation, artificial regeneration and even-aged forestry were criticised. A further conflict issue involving the Forest Service was forestry in the French overseas territories, particularly in Guyana.

Private forestry was not an equally important theme of conflict, although the lignicultures of poplar and to some extent also those of maritime pine raised environmental concern. In private forestry, an intensive conflict was caused by the adoption of the EU Habitat Directive, which was strongly opposed by forest owners as limiting their property rights through increased environmental regulation on valuable sites (d4). In relation to forest protection schemes, the conducting of nature value inventories was also an issue from which conflicts arose.

A struggle of competencies existed between the forestry administration and the relatively young but growing environmental administration (c3), causing conflicts, for example, in relation to park administration (m4). Many informants perceived these conflicts between administrations as very important. The management of parks and urban forests not only created tension between the forestry and environmental administrations, but also in relation to the environmentalists and the public (a4). For example, owing to direct action of environmentalists, the conflict over the Forest of Fontainebleau near Paris raised public debate and media attention at the national level on several occasions (e3). Conflicts related to the Forest of Fontainebleau involved an area with a mix of high cultural and ecological values, high level of wood production, and intense multiple use traditions. However, in most other conflicts, the involvement of diverse sectoral interests in the conflicts was more limited to traditional forestry-

environment relations.

The local nature of most conflicts is illustrated by the fact that, in addition to environmental concern, most conflicts were characterised by a strong defence for private ownership (d4), and natural heritage (d3, d5), which are highly valued among the French population. In some regions, also non-wood products may have more economic value than wood (j5, o2). In France, forestry plays a minor role in the national economy (d2), and there was said to exist little interest in, and poor knowledge of, forestry issues among the public at large. Subsequently, misbeliefs were claimed to have an important role in the public forestry debate.

The French environmental movement is rather dispersed (d1), and, regionally or locally organised. Although a national network also existed, international networking of the environmental movement was limited. For example, WWF was the first international environmental NGO to be active in France in the 1990s. In fact, from the beginning of the 1990s, an international dimension entered the discussion, leaving a 'vacuum' at the national level, where conflicts were fewer. Stronger international pressures towards sustainable forestry seemed to have been caused by international policy processes and agreements than by international environmental NGOs or the international markets of forest products. Accordingly, external pressure for increased forest protection or environmental consideration in forest management was weak compared to most other cases in this study (c1). Owing to little external market pressure, it is also natural that the forest industry, which is not a forest owner itself (c2, j4), was not a major actor in the conflicts.

The relationships between the forest and environmental sectors appeared rather distant but not very polarised. Although any mix of professionals in forestry organisations was not mentioned (f4), neither did any of the interviewees mention any particular organised counter movements against environmentalism (f5). Moreover, the organisation Pro Silva, which promotes nature-oriented forestry, had a recognised position also among forestry professionals. As a result of conscious efforts on both sides, the relationship and communication between various interest groups related to forestry seemed to have improved during the

early 1990s, and was reflected, for example, in increased co-operation. Yet, strong tension still existed particularly between the radical edge of environmentalists and the more traditional core of the forestry profession.

In general, the national policy processes related to forestry initiated little environmental conflicts in France. The fact that little pressure for review of the forestry legislation existed (h1) from an environmental point of view may have also reduced pressure for conflicts related to policy processes. On the other hand, especially the forest owners expressed some criticism over their limited possibilities to participate in decision-making regarding new environmental regulation (i3). Although since the early 1990s in France, the major environmental NGO network had gained a rather 'official' position in forest policy as a representative of the environmental movement, it was not called to participate as a committee member in forest policy revisions (i3). Neither were methods of public participation applied in relation to overall forests management by the Forest Service (i4). Forest policies were not an issue of political interest (i1), although the forestry administration was reorganised, owing to shifts in political power.

In France, there is a basic difference between the goals of the two major forest policy means. The French forestry legislation, the Forestry Code, is based on a multiple function principle (g4), which is rather well accepted among various interest groups. In addition, as the forestry legislation is a combination of decrees from various times, individual decrees can be flexibly revised, which tends to reduce conflict potential. The other major policy means, subsidies provided by the National Forestry Fund (FFN), are strongly based on a wood production goal, and were criticised by the environmentalists for promoting the destruction of valuable habitats.

Although the Forestry Code was not revised from an environmental point of view (h1), significant changes occurred in the Forest Service's official policies and texts, which increasingly emphasised the multi-functionality of forestry. However, these new policies were criticised for poor implementation at the national scale and for not taking a 'real' approach to ecosystem management (h5, n2). Economic subsidies, for

example, had not been redirected to consider the new environmental demands (h3). However, there seemed to exist significant regional and local differences in implementation, and the Forest Service acted vigorously in some localities and regions.

In the 1990s, The French forest sector faced a profitability crisis owing to currency policies of Scandinavian countries. This meant decreased profitability of forestry (k4). Moreover, natural disturbances, particularly storms, caused some fluctuations in wood prices, but this was not claimed to have any impact on the conflicts.

The French consumers or customers raised rather limited environmental pressure for sustainable forest management. However, as the French paper industry exports about 40% of its production (j2), it recently faced some international market pressure for sustainable forest management, and became active in the discussion about forest certification. However, in France, the discussion about forest certification was initiated within the forestry administration, from which it first spread to the forest industry, and only then to the environmental organisations (l4). However, like in other countries, the forest sector became concerned about its image and launched campaigns directed especially towards the public (l1).

In France, very little natural forest exists, most of which is protected (m3). The interviews claimed that the public at large was not aware of the existence of such forests. Accordingly, only the environmentalists raised demands for increased forest protection. The area of protected forest was not increased to any significant degree (n1). During the 1980s and early 1990s, significant changes were not claimed to have occurred in the use and management of forests resources at the national level, despite the criticism that several forestry management methods (e.g. logging road construction, choice of tree species, monocultures) raised (n3). However, in this respect, it should be remembered that regional and local differences in responding to environmental pressure at a practical level are great.

Specific conflict management approaches, despite some participation efforts in urban areas, were rarely mentioned in the interviews. As a whole, conflict management in France can be viewed as a series of individual initiatives, with

emphasis particularly on information dissemination and some focus on improving relations. The need to inform the public and journalists of forestry issues was frequently mentioned as an important strategy to deal with the conflicts (p5). Moreover, individual co-operative projects of rather official nature between environmental and forestry organisations were mentioned (r3). Accordingly, conflict management in France focused more on communication over substance and the institutional improvement of relations, than on interactive communication, or on substantial changes in forest policy (e.g. processes and implementation) and forest management.

3.2.3 Minnesota, USA

Particularly in the northern parts of Minnesota, forests dominate the landscape (m1). Forests in Minnesota were first logged on a large scale in the late 1900s, resulting in the lack of old-growth forests (a1, m2). Accordingly, forest protection was not a significant theme of conflict in Minnesota, and minor developments in forest protection took place (n1). Owing to fell and clear practices, after which much of the forestland was left to regenerate naturally, the Minnesota forests are no longer semi-natural. During the 1980s and 1990s, clear-cutting was the dominant logging regime in Minnesota (m5). Although aspen dominates many stands, they are not established monocultures. Thus, the traditions of modern forest use are short in Minnesota.

During the period investigated, environmental conflicts in forestry in Minnesota were mild (b4) and they rarely localised to specific sites, or involved on-site protests or strong campaigning (b1, b3). Instead, there was considerable willingness to solve differences through direct communication between actors (r2). At the informal level, there was much co-operation between organisations (e2, f2, r3), professional mixing in organisations (f4, r4), particularly within the Forest Service, and public participation was used to support forest management planning in federal forests (h2, q2). All this indicates that the conflict partners communicated values more through constructive channels such as open dialogue and policy processes, and less through the public or

through direct action. Indeed, most conflicts in Minnesota can be characterised as differences or disagreements, with some dispute. Because of the mild nature of the conflicts in Minnesota, the conflicts did not raise significant public debate or media interest (c4). However, the mild nature of conflicts did not eliminate the existence of litigation, which, in fact, was considered as a 'normal state of affairs' in any forestry debate – as one natural channel for value communication (b2).

The major theme of conflict in the late 1980s and early 1990s was the level of harvest (a2). The total annual wood consumption increased by 70 percent in the 1990s, raising considerable uncertainty about the long-term sustainability of the state's forest (n4). Especially the harvest rates of aspen and oak increased dramatically. The issue of increasing harvest level made the forest industry an important actor in the forestry discussion; whereas the harvest level was questioned mainly by the state chapters of mainstream national environmental NGOs. Accordingly, forestry in Minnesota faced very little external environmental pressure (c1).

Along with the general concern over increased harvest levels, more specified concerns over forest management practices also emerged. It was questioned, for example, whether clear-cutting should be continued, leading to monocultures and to the expansion of short-lived species like aspen, or should uneven-aged management or diversity of species be favoured. Although conflicts have traditionally concentrated on public lands, a debate over the management of private forests also began to emerge. This debate largely focused on to what extent forest management practices should be regulated, if at all, and whether regulation should be voluntary or mandatory.

There is a great decline of population in rural Minnesota, which was claimed to lead into growing distance in the people's relationship to forests and forestry. Yet, the survival of forest dependent communities was not such a big conflict issue in Minnesota as in the Pacific Northwest (a3, d3). Very few communities are totally dependent upon forestry (o4), and in addition, forest dependent communities in Minnesota were said to be more 'mill-dependent' than 'logger-dependent'.

A feature specific particularly for Minnesota

is the diversity of actors involved in the environmental forestry debate (c5). For example, conflicts in Minnesota involved debate over the rights of the Native Americans (o3). However, most interviewees agreed upon the fact that this issue is still a rising one, and has great conflict potential in the future. Deer hunting is a very traditional form of recreation in Minnesota, and deer hunters have an active interest in the state's forests. Minnesota's resort community also has a strong interest in sustaining the forest resources in a manner that protects its recreational and aesthetic value, because of their strong dependence on the character and quality of the surrounding environment (a4, d5, o2). Moreover, communities are important forest owners in Minnesota. These interests, among others, participated the discussion about the recreational use of forests in Minnesota. Within such a setting of multiple actors, little conflict existed between the various administrations dealing with forestry issues (c3, i2).

In Minnesota, much of the environmental debate related to forestry took place within a major process of policy reform (n1), which began in the late 1980s and continued even at the end of the period investigated. Owing to the concern raised by significant increases in the demand for wood fibre, the state's Environmental Quality Board was in 1989 presented with a petition (initiated by environmental groups and signed by 400 citizens), requesting a state wide Generic Environmental Impact Study (GEIS) to be done on the environmental impacts of the rising timber harvest levels (i5). After lengthy discussions and support from a variety of interests, the EQB unanimously decided to commission the Timber Harvest GEIS.

Work on the study was begun in 1991 and completed in 1994. The work was commissioned from a private international consulting company, and it produced 14 technical documents, including a total of more than 4000 pages. Rather than being an inventory of natural values, it was an assessment of the environmental consequences of the rising harvest level. The study was so complicated that anyone could find aspects supporting their own views. Environmentalists and the industry interpreted the results of the study in very different ways. Subsequently, the debate around harvest levels accelerated after the study

was completed. The GEIS process was important in encouraging on-going dialogue between different interests (e4, r2). After the GEIS study, an Implementation Strategy Roundtable was established comprising all interests involved (i3, q3, q4). The work finally resulted in the enactment of new forestry legislation in 1995 (n2). Supported by major stakeholders, the passing of the new Sustainable Forest Resources Act did not raise much political debate. In contrast to the Pacific Northwest, forestry is not a politically important issue in Minnesota (i1).

Instead of clear norms for forest management, the new act was strictly based on voluntary action. The voluntary approach to forest policy did not include, for example, any subsidies to environmental consideration in forestry (h3). The voluntary approach was motivated by positive experiences from implementing Best Management Practices and Visual Quality guidelines, etc. For example, substantial activity in the voluntary implementation of more environmentally friendly logging took place (n3, p4). The new direction in forest management was accompanied by extensive logger education campaigns and logger certification (h4, r5). Also as a whole, the amount of traditional clear-cutting decreased, and water and visual quality were also increasingly taken into consideration. Moreover, in forest management in the 1990s, there was a significant shift in talking about ecosystem management especially within public forestry in Minnesota.

However, the voluntary approach to forest policy was not without problems. By the end of the period investigated, despite the very open and participatory policy process, and clear advances in environmental consideration in forestry, there was recognisable dissatisfaction by the environmental organisations on the implementation of the new forest policy from a voluntary basis (n5). In 1996, a Forest Resources Council and Forest Resources Partnership were appointed for planning how to implement the new legislation.

Minnesota also exports forest products outside the state, but mostly to environmentally less sensitive markets in the USA (j1). However, Minnesota also exports forest products to Europe, and gradually had to respond to some market pressure. However, in addition to some nationwide initiatives, this pressure had not yet resulted in

any specific campaigns or attempts to impact the markets (k3, l1, l4, q5). However, there seemed to be willingness and readiness to take into use also market tools as soon as the pressure was strong enough. Although the conflicts in the Pacific Northwest also increased wood prices in Minnesota (k2), the conflicts in Minnesota did not have any specific impact on wood or forest products, nor have any cyclic impacts been detected. Forestry in Minnesota was not claimed to having faced any significant problems of profitability (k4).

Conflict management in Minnesota included a variety of voluntary approaches with less emphasis placed on authoritarian solutions. The use of open discussion in roundtables with broad-based participation of interests has become the most important conflict management tool (r2). Still, regarding public forest management, decisions were often made by the courts as in any other part of the country (e5, p1). In conflict management, strong focus on substance management has also taken place through the extensive role that research and other information collection (e.g. GEIS) had in guiding policy decisions (p2).

3.2.4 Norway

Owing to the mountainous landscape and harsh climate, forestry in Norway is concentrated in the southern parts, and the most densely inhabited parts of the country. Because of the mountainous terrain, logging conditions are difficult. Nearly one quarter of the forests are considered as economically inaccessible. Together with small-scale forest ownership, it entails varied treatment of the forests, which can be considered as an advantage for the environment. Forestry in Norway is largely based on forestry management regimes including clear-cut (m5), and on the use of native tree species, excluding sitka spruce, the use of which has raised some debate.

During the period investigated, environmental conflicts in forestry in Norway were rather mild, involving mainly discussion and little public debate (b1, b2). Conflicts remained mostly at local level and only occasionally reached national or international levels. In Norway, it was said to be easier to get the public involved in more

classical issues of debate such as energy and nature conservation, than of the problems that forestry may be causing for ecological systems and species. Therefore, the environmental NGOs did not define the public as a vital target group in their work for increased environmental consideration in forestry. Accordingly, the environmental movement was not very active in campaigning in forestry issues towards the public (b3, e3). Yet, work towards the consumers in Central Europe has been an important strategy of the environmental NGOs.

Outdoor life is an important part of the life of the Norwegians, and forests are important recreational environments for them (d5). Public right of access has made multiple use of forests an extremely important aspect of forestry. Owing to increasing recreational pressure upon forests, multiple use was the most important theme of environmental conflicts in forestry in Norway in the 1980s (a4). Consequently, environmental conflicts in forestry largely concentrated around urban areas. The recreational conflicts had many dimensions and occurrences but the most important of them were the conflicts in the Oslomarka area (m4) surrounding Oslo where the conflicts had deep roots since the 1960s and 1970s. However, in the late 1980s, after new regulations prepared in co-operation between different interests, the conflicts began to diminish. Urban forests around a few other cities (e.g. Drammen and Trondheim) also raised occasional public debate. In rural parts of Norway, which represent most of the land, the potential for environmental conflicts in forestry was lower.

In 1989 an official report about multiple use in forestry set the basis for a wider discussion about forest roads, wood species change, special considerations for urban forests and mountainous forests. Multiple use of forests did not create such markets of non-wood products that would have greatly affected the environmental forestry debate (j5). Although only small changes in forestry legislation have been made, since the paper on multiple use, the forestry sector has made a great effort to implement the environmental aspects of the forestry legislation, despite the fact that economic values and employment dominate other interests in the legislation (g4). Forest management in Norway has changed considerably in the

1990s, along a shift towards ecological thinking (n3, p4).

The most visible changes included the downsizing of the areas of individual clear-cuts, increased acceptance of broad-leaved trees, and in the re-appearance of uneven-aged management and natural regeneration. Moreover, there was a clear increase the area of land used in alternative ways, including fishing, hunting, recreation, etc. Special subsidies for increased environmental consideration in forestry had not been generated, but subsidies for environmentally sensitive forest operations like road building had decreased (n3). The interviewees did not mention any business cycle effects of conflicts, or profitability issues (k4) related to environmental conflicts.

A further dominating conflict in Norway in the 1990s was the protection of old-growth forests through the Protection Plan of Coniferous Forests (a1, m2). The two most debated individual issues within the larger theme were the incidents that took place at Skotjernfell, and the protection of the coastal coniferous forests in the Western coast of Norway (c4). Skotjernfell is a forested area owned by a private forest common, situated within Oslomarka. In the early 1990s, logging permits were granted for an area, which was considered as valuable old-growth by the environmentalists. This resulted in attempts to prohibit logging and finally to prohibiting the selling of the timber by marking felled timber with signs of “virgin forests”. Conflict resolution was sought through the Protection Plan for Coniferous Forests. The coastal conifer forests, ‘the European rainforests’ are situated in the mid-section of Norway – an area with high humidity all year around. At first, the area was not included in the Protection Plan for Coniferous Forests, and international attention to the issue was raised through the international network of the environmental NGOs. Owing to increased forest protection (e.g. the Protection Plan for Coniferous Forests), the area of protected forests has slightly increased (n1). Although the environmentalists actively participated in the debate over the protection plan for coniferous forests, the final implementation of the program did not raise debate (h5). However, there was wide disagreement over the level and need of additional protection (g3).

Additional themes of conflict included the 'red list' of threatened species, and the WWF score-card on forest policy. Community and private ownership values were not found to play a dominant role in the conflict rhetoric (a3, d3, d4). The impacts of increased forest protection to rural employment were discussed to some extent, but it did not rise into a dominant issue of debate like in Finland or the Pacific Northwest. Reindeer herding by the Sami mostly takes place in areas of little value to forestry. Therefore, indigenous use of forest has not been a major conflict issue (o3).

Traditionally, environmental conflicts in forestry in Norway had been affected by the forest sector's isolation and lack of communication with other sectors of society, including environmentalists. However, a significant change in this respect took place since the mid-1980s, along with broadened debate on multiple use. The attitude change was also strongly promoted by education campaigns (e.g. Richer Forest) (h4, r5). Lately, values have been communicated mostly through open discussion and co-operation (e2, f2, r2, r3). Direct action (b1), and policy and judicial processes have been less important channels of value communication (e4, e5). A significant amount of co-operation between organisations from different sectors, and also some mix of professionals with different background (f4, r4), particularly employed by the industry in the 1990s was reported. Communication towards the public was also said to be important.

In Norway, the participation of various groups in forest policy has increased in the 1980s and 1990s. This is due to the decentralisation of policy decisions, and increased openness in the processes. The participation of environmental NGOs has become increasingly formalised (e.g. hearings and contact meetings) and part of everyday policy-making. In particular, this was visible in the process of Living Forest. Policy revisions have been made gradually, and through co-operation, including much work on voluntary implementation. It seems that the new co-operative atmosphere has, to some degree, compensated for the need of substantial policy revisions (h1, n2). Moreover, owing to good informal co-operation, institutional systems of public participation have not been created, nor forcefully demanded by the

environmental movement (h2, q2). Another factor that may have affected the lack of reform is that a struggle has existed between the environmental and forestry authorities (c3, i2), as to whether the protection of the conifer forests should be done within forest or environmental policies. Yet, forestry has not been a subject of significant debate between political parties (i1).

Like the other Nordic countries, Norway also exports forest products to environmentally sensitive markets in Central Europe (j1). In fact, the forest sector is rather export oriented (j2), although not quite to the same extent as in the other Nordic countries. The forest industry was strongly involved in the conflicts through the markets of forest products (c1) but also to some extent as a forest owner (c2, j4). The conflicts and 'hotspots' like Skotjernfell (l2) were not claimed to have impacted the wood markets to any great degree (k1, k2). Instead, they raised strong pressure on the international markets of forest products (k3), and a need to improve the image of the sector. The project Living Forest had a central role in the forest sectors joint effort to promote the image of Norwegian forestry (l4). Positive expectations of markets were not met (l3). Many different interests (with interests in sustainable forestry, monitoring and documentation) (i3, q3) have participated the Living Forest project. The project was also active in creating forest certification (q5). Market pressure has also affected the political will for increased forest conservation.

Conflict management in Norway has changed considerably during the period of investigation. From reactive management, conflict management has shifted towards preventive work (e.g. work on relations) (r2, r3) and voluntary action towards increased environmental consideration in forestry (n3, p4). This seems to have compensated for major policy revisions, to some degree.

3.2.5 *Pacific Northwest, USA*

In the Pacific Northwest, the forest covers only a small proportion of the land. Yet, owing to relatively short traditions of modern forest management (f1), substantial areas of old-growth forests still exist (m2). In the Pacific Northwest, the forest

debate since the early 1980s has largely focused on how public forestlands should be managed, so that the need to protect and preserve old-growth forests, fish, wildlife and water, as well as the needs of the businesses, and communities dependent on timber sales are recognised (a1, a5).

In the Pacific Northwest, the harvest level rose rapidly in the 1980s (n4). Still, it was not the level of harvest per se that induced the conflicts, but the areas – old-growth forests – that were logged, most of which are under federal ownership. The Northern spotted owl has been used as a symbol for the disputed old-growth forests. The ‘owl controversy’ has been intense throughout its existence, changing from debates and campaigns to litigation, and frequent protest and direct action on-site (b1, b2, b3, b4). Other regions in the United States followed the conflict closely. Raising the issue into public awareness at the national level became one of the major means of influencing for environmental groups that have very effective national networks (c4, e3). The conflict also reached international attention; however, international organisations had little direct interest or influence on the conflict.

Although much of the population in the Pacific Northwest have immigrated to the area in seeking for aesthetic environment (d5), the conflicts have been so polarised into ecological vs. community values that multiple-use issues have not raised similar concern (a4), despite the fact that motorised recreation, for example, was heavily debated. Moreover, as in Minnesota, although native Americans were not commonly considered as major actors in the conflicts, they were considered to hold great conflict potential in the future (o3).

The most important characteristics of the environmental movement in the Pacific Northwest is its heterogeneity (d1). This was reflected in the different size, focus on geographical levels, and attitudes towards co-operation of various organisations. Significant tension also existed between large national environmental organisations and local groups. As a whole, the environmental movement has grown, and become more professional and institutional. Subsequently, lobbying through the Congress has become one of the major channels of influence for larger environmental groups (i1).

There was also significant heterogeneity within the forestry profession. Although there was a significant mix of professionals with different educational backgrounds employed by the Forest Service (f4, r4), professional mixing was not so common in other organisations, nor did the interviews reflect much inter-sectoral co-operation (e2, f2, r3). Part of the profession was strongly involved in counter movements against environmentalism (f5).

The forest industry was strongly involved in the spotted owl conflicts, particularly the sawmill industry and local communities. The federal timber supply is crucial for most wood products firms that have little or no forest of their own. These firms tend to be located in forest-dependent communities surrounded by federal lands (o4). Local loggers, small sawmill owners and employees were the most directly affected groups of people in the conflicts over the protection of old-growth forests (j3, o5). Indeed, the conflicts also strongly involved debate of the social impacts of environmental protection (a3, d3). Communities were strongly involved in the conflict also because the communities traditionally receive some revenues from forestry practised by federal land agencies.

The polarisation of interests (c5) was strengthened by conflicts between different administrations (c3, i2). The infected relationships between different sectors were also reflected in the fact that most value communication took place through formal channels such as policy or judicial processes (e4, e5), or through non-communicative informal channels such as the public or direct action. Excluding some successful local initiatives (e.g. Applegate Partnership), little direct face-to-face value communication was said to exist (e1, r2).

The habitat conditions of Northern spotted owl is most commonly found in late-succession or old-growth forests, and the owl is found only in the Pacific Northwest. The conflict included many different phases. At first, the debate largely focused on the ecological requirements of the owl population, and whether or not the owl should be listed as threatened, and on how the requirements of the owl should be met within planning processes of public agencies. During the owl controversy, several inventories of the spotted

owl were made, forming an important element of the conflict processes. However, early inventories were made difficult by the lack of comprehensive forest data and maps. Finally, the owl was listed as threatened in 1990.

During the late 1980s and early 1990, a series of attempts were made to prepare conservation plans for the spotted owl, and as frequently, litigation was raised against the public agencies. Particularly, the commonly existing failures to complete adequate environmental impact statements for proposed activities on federal forests formed the basis for frequent lawsuits, most of which were filed by citizen and environmental groups. Within these processes, federal environmental legislation caused more conflict than state-specific regulations of forest management. The impacts of environmental legislation on forestry dramatically increased in recent years, as the original legislation was authorised in practice and its scope has been expanded, and as the courts became more involved in interpreting the broad statutory mandates (h5). Thus, much of the legislation passed in the 1970s has had far reaching consequences that were not clearly visible until the owl controversy.

As part of his election campaign, Bill Clinton promised to break the gridlock over management of federal forests of the Northwest (i1). Following the promise made, as President, he held a Forest Summit in April 1993 in Portland, Oregon. As one effort in attempting to resolve the conflict, Clinton established a task force, the Forest Ecosystem Management Assessment Team (FEMAT) in order to identify management alternatives that attain the greatest economic and social contribution from the forest (q1). The scientific community played a crucial role in this work (i5, p2). Finally, the controversy was 'resolved' at the political level. As a solution to the conflict, the President offered large areas to be protected (n1) and large sums of compensation to be paid to the local communities.

Forest health also became an important issue in the forest debate, and resulted in the enactment of the so-called Salvage Rider dealing with the salvage of dead and dying timber. Partly the motivation of some provision of the rider was the claimed failure of the federal agencies to provide even the minimal amount of commercial timber

promised under the President's Forest Plan. In fact, the enactment of the Salvage Rider and subsequent logging in disputed areas induced a new series of on-site protests.

An additional broad theme of conflict was the general role of public forests (a5). It was questioned, whether prevailing budget practices enable the federal forest managers to produce the variety of multiple goods and services demanded by the public. Moreover, some pressure existed to increase local control in public forestry. The sensitive issue of private property rights also raised debate (d4), especially due to the owl controversy.

Along with the large-scale protection of old-growth forests (n1), forest management practices were debated, too. In particular, clear-cuts, road building and the impacts of forest management on water quality and salmon populations raised debate. In general, the debate has shifted from single species concerns to concerns of a broader scale: to the protection of biodiversity and ecosystems. The increased awareness of the inter-relatedness of different components of ecosystem was particularly well reflected in the new Ecosystem Management approach of the Forest Service (n2). In the new ecosystem management approach, managers began to focus on forest dynamics within larger geographic areas. Moreover, public participation methods received increasing focus (h2, i4, q2). However, the implementation of such policies began to raise slight concern. This new direction did not extend to private forest, to the same degree, although private forests are more regulated in the Pacific Northwest than in Minnesota. Private forests did not have any economic support system for environmental concern. Neither had the new direction resulted in extensive education campaigns outside the Forest Service (h3, h4).

The price of wood began to rise around the mid-1980s because of a shortage of supply from federal forests (a2, k1, k2). This increased the demand of wood from private lands. The increase in the price of wood encouraged some companies to consider the environment more, but many companies, as well as non-industrial private owners, decided to shorten the rotation length, because of increased prices and a shortage of wood supply. The economics of public forestry has also been

an issue, through the so-called below-cost timber sales of the Forest Service. However, despite being a substantial conflict issue, it cannot be regarded as a major element in the environmental debate.

The Pacific Northwest region is an important exporter of wood and forest products, both in the USA and internationally. However, the markets are not environmentally very sensitive (j1, k3). Despite a number of ‘hotspots’, they were not used as means to impact market, but to impact policy (l2, l2). Certification had not yet been widely debated by the forest sector (l4, q5), although there was some interest in the issue within the environmental movement. Since the late 1980s, the forest industry increased its public relations campaigns. In order to improve their image, many companies paid more attention to the way they manage their lands. Some companies became progressive in forest ecosystem management. Conflict management in the region has included a variety of strategies from policy changes to court injunctions. A scientific approach has also been used to resolve differences (p2). This is evident in the emphasis placed on the FEMAT process, and the interest of scientists in developing conflict management techniques. Relatively less work had been done to improve relations between the different conflict partners (r2, r3, q3, q4).

3.2.6 Sweden

Sweden is a long country that extends from the temporal forest zone to the Arctic Circle. Forests in Southern Sweden are very productive, but in the North, extensive mountainous forests exist. Swedish forest management is based on a joint implementation of thinning and clear-cutting, with some use of exotic species (e.g. lodgepole pine) (m5). The forest management regime tries to imitate natural processes, and Swedish forests are largely semi-natural. In contrast to the early 1980s, today the annual cut is smaller than the annual increment and the annual sustainable cut. Dramatic changes in harvest levels that would have affected the conflicts were not reported (n4).

Conflicts in Sweden tended to decrease some-

what in intensity since the 1970s, despite some periods with temporarily stronger aggravation. During the period investigated, conflicts in Sweden mostly involved strong campaigning (b3). The media showed limited interest in other forestry issues at the national level (e3). Partly, this may be due to the fact that instances of physical on-site protests or direct action were not mentioned by the interviewees (b1). In the study, two major conflict themes were identified: the protection of state-owned forests in the coniferous mountainous region (a1); and preserving biodiversity in all forests.

The forests in the most remote mountainous regions become economically accessible for logging only during high economic conjuncture, thus, intensifying conflicts related to old-growth forests. In the early 1980s, forest management expanded to a higher altitude in the mountainous region in northwestern Sweden, where large areas of old-growth forests were claimed to exist (m2). This raised intensive conflicts not only between environmentalists and foresters, but also between the indigenous reindeer herding Sami villages and foresters. Litigation, for example, has occurred only in relation to conflicts between forestry and reindeer herding which has not principally been an environmental issue (a4, b2, c5, e5, o3). In the early 1980s, the mountainous forests conflict focused mainly on forests managed by the Forest Service, but after considerably increasing forest conservation in this region, the focus of criticism increasingly shifted towards forests situated in lower altitudes and owned by the forest industry (c2, j4, o5). The conflict resulted in the protection of substantial forest areas in northern Sweden (n1). However, the lack of resources for implementing the protection programme raised concern even in the 1990s.

The conflict over preserving environmental forest values emerged in the 1960s and intensified particularly in the late 1980s. This was largely due to increased information produced by research on threatened species and on the impacts of forestry management on these species. As the forests owned by the forest industry have traditionally been the most intensively managed forests in Sweden, and as the forest industry is a considerable forest owner in Sweden, the debate has most strongly focused on their forests (c2, j4). The

Swedish forest industry is a considerable forest owner, particularly since the forests of the Forest Service were transferred to the ownership of a governmental company (AssiDomän) (h2, n2).

In the 1980s, accusations against forestry were mainly based on criticism of individual forestry management practices, such as the size of clear-cut areas, draining, ploughing, artificial regeneration with lodgepole pine, and the use of herbicides. During the 1980s, significant reductions have taken place in regard to all these activities, and some have even diminished. Yet, most interviewees noted that the most perceivable changes in forest management towards increasing environmental consideration have occurred since 1991–1992 (n3, p4). Simultaneously, though, it was claimed that improved profitability of forestry improves the possibilities for increased environmental consideration in forest management. In other respects, the profitability of forestry has not been a major argument in the forestry debate (k4).

Accordingly, environmental conflicts in forestry in Sweden mainly polarised into struggles between forestry and environmental organisations. In relation to these struggles, the socio-economic impacts of environmental protection, or community, ownership or amenity values did not raise as much discussion (a3, d3, o4), nor were the conflicts related to specific administrative struggles (c3, i2). At first, the environmentalists' ideas were strongly rejected by a forestry profession protecting its traditional paradigms, leading into a struggle of influence that only gradually led to mutual respect and agreement on problem formulation in the late 1980s. This is also perceptible in the employment of ecologists by the forest industry in the mid 1990s (f4, r4). Moreover, environmental organisations (e.g. Steget Före) were consulted on issues related to nature inventories. A more open dialogue was born between a large part of the actors in both the forest and environmental sectors, and some co-operative projects were initiated. In Sweden, mainly dialectic channels for value communication were used, either face-to-face or through the media (e1, r2).

During the period investigated, the influence of the Swedish environmental administration and NGOs in forest policy increased in more direct

ways, being perceptible, for example, in their increased participation in various policy and planning processes (i4, q2). These changes may also be one reason why involving the public in forest management planning, as a method of conflict prevention and resolution, was not initiated in Swedish forestry in any large degree, with perhaps some exceptions in urban forestry (q2).

In relation to forest policy, more criticism seems to have been focused on policy means and implementation, rather than policy goals (h5). This may be due to the fact that Swedish forestry legislation had already included an environmental paragraph in the 1970s. Criticism against policy implementation was particularly strong in the late 1980s, when research revealed the rather poor implementation of the environmental paragraph of the Forestry Act, and gave the environmental organisations strong arguments with which to criticise forest management. Subsequently, extensive education programs related to basic forest ecology were launched (e.g. Richer Forest) (h4, r5), and environmental consideration in forest management began to clearly increase in the late 1980s (n3).

Regarding policy means, particularly the high level of subsidies and the level of detail of regulation related to wood production were criticised heavily in the late 1980s by both environmentalists and foresters, until a major policy revision was initiated (h1, q4). New forestry legislation was enacted in 1994, giving equal emphasis to wood production and the environmental functions of the forests (p3). Although this was a profound change to the previous wood-production dominated goals of the legislation (g4), the new goal was formulated under considerable consent and without party political conflicts (i1). The scientific community was rather active in this policy revision process, but mainly from an economic point of view, not environmental. The implementation of the new forestry legislation was also an important concern for the forest as well as environmental sectors, although from slightly different points of view.

In the 1980s, environmental organisations promoted their interests mainly through the policy process, but since the early 1990s, increasing emphasis was put on the markets of forest products. The Swedish forest industry is vitally

dependent on its customers in Central European countries such as West Germany, the United Kingdom and the Netherlands (j2). The potential brought about by signs of rising 'green consumerism' in these countries has been effectively realised into actual market pressure by the international environmental movement. In addition to promoting the mobilisation of direct consumer pressure, the environmental movement has effectively pressured the customers of the Swedish forest industry (e.g. publishing houses and retail store chains) to demand an environmentally sound origin of their products (c1, j1, k3). Owing to a strong tradition of national criticism against forestry, there have existed limited possibilities for the spreading of international environmental NGOs (non-governmental organisations) in Sweden in the field of forestry. Instead, Swedish environmental NGOs have built strong international networks.

These changes in the market environment of the forest industry accelerated the changes within the forest sector that began already in the 1980s. The forest industry responded to this international pressure and boycott threats (l2) with, for example, intensified image and information campaigns, increasing its competence in issues related to forest ecology, ecological landscape planning initiatives, changes in forest management supplemented with respective follow-up processes and data production, and by participating the debate related to forest certification. The certification initiatives were promoted by the good experiences received from the chlorine-free campaign of the environmentalists (l3, l4, q5).

As a whole, conflict management efforts in Sweden were rather reflexive during the late 1980s and early 1990s, and focused on various social structures and processes in a rather balanced way, although with some clear periodic variation in emphasis. This seems to have reduced the intensity of the conflicts in a situation where the existing forest characteristics and dependence of international trade and images otherwise tended to increase the intensity of the conflicts. Conflict management in Sweden did not only rely on proof or force. Instead, conflict management included changes in policies and practices, as well as an input in preventive action, and relationship work through co-operation with NGOs.

3.2.7 West Germany

Although two rather forested states were chosen for the interviews, West Germany as a whole is not dominated by forested landscape (m1). No rapid changes in harvest levels have occurred (n4). German forests include different management regimes, from monocultures to traditional uneven-aged management (m5). Annual cuttings are clearly smaller than the annual increment. Owing to long forest use traditions (f1), much of the forest can no longer be classified as semi-natural, and unprotected virgin forests no longer exist (m2). These characteristics of the forest resources and forestry have also impacted the nature of conflicts.

Environmental conflicts in forestry in West Germany constantly increased during the period from 1984 to 1995. Still, conflicts in West Germany were mild and they raised very little public interest compared to most other cases of this study (b4). On-site protests were not reported by the interviewees (b1), and litigation to induce, or alter, policy changes or policy implementation was used only in specific situations (b2, e5, p1), mostly related to the compensation demands of landowners.

The conflicts in West Germany involved rather few different types of actors. In West Germany, the public's environmental awareness has grown, but modernisation and urbanisation was claimed to have led to the public's alienation from understanding natural processes and to a poor knowledge of and interest in forestry. Moreover, multiple use interests were rarely mentioned in the interviews as major conflict actors (c5), and neither was the forest industry strongly involved, not being a forest owner or pulp producer itself (c2, j4). Non-wood markets in West Germany are small, involving mainly hunting. Although the amount of game has caused conflict, it has not primarily been considered as an environmental issue (o2).

Accordingly, environmental conflicts in forestry in West Germany have mostly included discussions between professionals: foresters and environmentalists. The relationship between these two groups held much tension but was not expressed very openly. At the formal level, already in the 1950s, the German forestry pro-

fession established an environmental association of its own for promoting nature-oriented forestry (f3), whereas no counter organisations or movements against environmentalism have been established (f5). At the informal level, little professional mixing took place within forestry organisations (f4), and little practical co-operation was mentioned to exist between the forest and environmental sectors (e2, f2, r3). These aspects may also be related to a strong struggle of competencies between the administrations (c3).

One of the major characteristics of the environmental forestry debate in West Germany in the late 1980s and early 1990s was internationalisation. In the mid-1980s, strong criticism and campaigning was first focused on tropical forestry, and then also on forestry in the boreal zone (Alaska, Canada, Scandinavia, Russia) with considerable impacts on the international markets of forest products. As West Germany is a significant importer of wood and forest products, forestry and forest industries in other countries were increasingly influenced by the environmental demands arising from West Germany (j1). German publishing houses were particularly caught in the crossfire between environmental NGOs and paper producers. The internationalisation of the forestry debate also had impacts on German forestry. The import of tropical timber was increasingly substituted by the use of German timber. In addition, the use of recycled and chlorine-free paper, and concern for the origin of the roundwood increased. Discussion about the certification of tropical timber also brought about the issue of certification of German forests. However, the discussions did not lead to any concrete initiatives (l4, q5). Yet, the forest sector campaigned for its image through joint efforts (l1).

Although German environmental NGOs became very active internationally, traditional local and national conflicts continued to occur, as the criticism presented against forestry internationally, the debate over forest decline, and low profitability of forestry also brought German forestry practices under closer scrutiny. In the early 1980s, forest damage by air pollution suddenly emerged as the most important theme in the German forest discussion. Although the discussion was basically not a conflict between environmentalism and forestry, criticism was soon

focused upon the impact that forest management practices was having on the vulnerability of forests to damage, particularly those of even-aged monocultures.

Damage caused by heavy storms slightly accelerated the shift from conifer monocultures to mixed and hardwood forests. During the 1980s and early 1990s, natural regeneration and planting with deciduous trees increased. Also, the use of pesticides was reduced and forest road construction decreased. In addition to environmental concern, economic considerations also supported a shift towards increasing environmental consideration in forestry (n3, p4). In the interviews, natural regeneration was often viewed as being less costly in comparison with planting, which is expensive in West Germany. On the other hand, fears were expressed that the low profitability of German forestry (k4) may create negative environmental impacts due to increased pressures to mechanise logging and to simplify silvicultural practices.

The debate over forest management involved a strong theoretical discussion on forest management practices, and especially nature-oriented forest management. More recently, the emphasis shifted to the more principled question of how forests should be used. In this respect, conflicts related to public forests were clearly more intense than those related to private forests. Yet, compared with the intensity of the forest damage discussion, or the tropical forestry issue, forest management in West Germany seldom raised strong public interest (c4, e3).

In relation to forest conflicts within Germany, the concept of old-growth forest was not used (a1). Instead debate focused on the remaining ancient semi-natural forests, which were claimed by environmentalists to have a poor conservation status. These factors characterise the whole forestry discussion, but more particularly the debate over protected areas. In West Germany, forest protection was discussed more on a principle level than in relation to specific localities. As very few conflicts occurred in specific localities, the conflicts did not reflect strong community or private ownership values (a3, d3, d4, o4), although these value dimensions may appear important in West Germany in other connections. The expansion of protected areas and parks into previously managed areas raised some local and

regional discussion. As these protection conflicts involved the creation of environmental values rather than their preservation, on-site protests did not occur.

Conflicts included significant struggles of competencies between different administrations (c3, i2). An important reason for changes in forestry practices and an increased amount of protected areas designated by the forestry administration has been the forestry administration's fear to lose their competence as authorities in many forestry issues to the nature protection administration. These areas were not old-growth forests, and seldom were areas designated as totally protected.

In Germany, forestry legislation is primarily enacted by the states. A framework act, the Federal Forestry Act, was enacted in 1975, giving the various forest functions (production, protection and recreation) equal weight (g4). Because of the comprehensive nature of the law, most environmental demands presented in the recent forestry debate were not in direct conflict with the existing forestry legislation. Therefore, although a strong theoretical discussion existed in West Germany about the goals of forestry, and although environmental legislation expanded considerably, little pressure for any major revisions of forestry legislation existed (h1, h2). Instead, environmental organisations demanded the amendment of the Federal Nature Conservation Act, which gave agriculture, forestry and fisheries an exceptional status.

Despite increasing power as pressure groups, environmental NGOs have demanded participation in forest management planning only in state and municipality owned forests, but not in the

policy formulation process (h2, q2). This may be due to the fact that little pressure for changes in the forestry legislation existed. The most relevant decisions regarding the use of forest resources were not made within the formulation (q4), but in the implementation, of forest policies. While environmental NGOs did not have an official status in forest policy committees, the Green Party politics became an important channel of influence for the environmental sector (i3).

The debate over the goals of forestry affected the implementation of forest policy. Here, a clear shift can be detected towards the emphasis of the protection and recreation functions of the forests. Particularly increasing emphasis was placed on the sustainability of forest ecosystems. Significant differences in attitudes still existed at the local implementing level, and both environmentalists and foresters expressed the need for increased education. The ecology programmes of some states (e.g. Lower Saxony and Baden-Württemberg), which were established by the forestry administration for state forests, reflected important responses to the environmental criticism. Also, financial subsidies increasingly included measures to promote nature-oriented forestry (h3). Overall in West Germany a new ecological paradigm was adopted gradually.

In West Germany, specific conflict management methods were rarely mentioned in the interviews, although scientific and relations work was sometimes referred to in more general terms. This may be a reflection of the fact that the conflicts were mild and raised very little public interest. Although the conflicts can be described as discussion oriented, this discussion took place in rather institutional settings.

4 Comparative Analysis of the Cases

4.1 Qualitative Comparative Analysis (QCA)

4.1.1 Models of Application

Charles Ragin (1987, 1994a) has developed a computerised method, Qualitative Comparative Analysis (QCA), for analysing categorised qualitative data in case-study research (computer-based application by Drass 1992). QCA uses Boolean algebra ('the algebra of logic and sets') for systematic analysis of similarities and differences across cases. The method is introduced and illustrated in Appendix 4. Here, only the different applications of the method and how they are used in this research are described.

Most commonly, QCA is used in macro-social study to investigate under which conditions a state of affairs is realised. The traditional causal application of the method is based on selecting one of the categories used in the analysis as the outcome (dependent variable). Subsequently, all other variables (independent variables) are analysed in relation to the selected one, in search for explanation of the outcome. In short, the model of the causal application to QCA can be presented as follows:

Model 1. Causal Approach

Independent variables: A/a, B/b, C/c

Dependent variable (outcome): D/d

Analysis: A/a, B/b, C/c => D/d

Where:

- A/a, B/b, C/c, and D/d refer to dichotomous variables (capital letter indicating that a certain condition is relevant for the case, and lower case letter indicating the category is not relevant for the case).
- => refers to producing an OUTCOME or EXPLANATION

As qualitative research is usually seen as an attempt to interpret phenomena in terms of

the meanings people bring to them, qualitative researchers may find QCA unattractive due to its causally oriented terminology and applications. According to Alasuutari (1995, p. 123), for example, the main problem of QCA is its in-built premises pre-supposing that the phenomena it studies can only be described as a systemic causal model.

In many qualitative research studies, constructing typologies and categories on the data may be the only reasonable and sufficiently interesting approach to make sense of the data and to provide understanding of different ways in which reality is conceptualised. Therefore, instead of asking what conditions produce a certain outcome, it may be asked what kinds of combinations of characteristics exist in the data.

Interestingly, there is one application of QCA in which the aim is to construct empirical typologies. In one of his early analyses, Ragin (1987, p. 150) addresses the question "how are juvenile courts organised?", the task of QCA being to describe the diversity that exists within a given class of social phenomena. It is interesting to note that Ragin does not give this type of analysis much emphasis: "It is important to note ... that the construction of such typologies is rarely the endpoint of an investigation" (Ragin 1987, p. 160).

The 'empirical typology' approach of QCA is described in Model 2. An artificial category 'exist in the data' (marked with 'EXIST') is used as the 'outcome' category for all cases. This approach is particularly applicable for condensing the data because it does not imply any specific kinds of relationship between the different categories.

Model 2. Empirical Typology Approach

Categories to be grouped: A/a, B/b, C/c

Artificial 'outcome' category: EXIST

Analysis: A/a,B/b,C/c= EXIST

Where:

- A/a, B/b and C/c refer to dichotomous variables (capital letter indicating that a certain condition is relevant for the case, and lower case letter indicating the category is not relevant for the case).
- = refers to producing a TYPOLOGY or GROUPING

In both Models 1 and 2, a pre-defined outcome variable has to be chosen. In Model 1 (causal analysis), this is the dependent variable, whereas in Model 2 (empirical typology) the artificial 'EXIST' category is used in order to avoid causal assumptions.

Despite significant advances in qualitative analysis software – at the time when this research was initiated – most qualitative methods were rarely used to do more than 'pattern analysis', that is discovering structural patterns (e.g. groupings) in the data. Yet, in order to answer the questions raised in the beginning of this research, it was necessary to go beyond pattern analysis and investigate the interactions of conflicts and conflict management with a variety of societal aspects.

A typical characteristic of the case study strategy is that the approach is recreated in each new research situation (Hellström and Hyttinen 1996, p. 390). Subsequently, a question was raised: Would it be possible to develop such an application of QCA, which would preserve the advantages of the method (see Appendix 4) and also allow for its use in a 'hermeneutic' (here understood as interpretative and understanding) way? Ragin (1987, p. 98), for example, emphasises that QCA should not be used mechanistically, but rather to accompany the researcher's methodological and theoretical assumptions and questions asked.

Model 3 below is based on joint work with Rantala on developing the hermeneutic approach to Qualitative Comparative Analysis (Rantala and Hellström 2001). In this model, multiple analysis are conducted from the same data so that each category is analysed in relation to all others, each at a time. This forces the researcher to have a look at the data from different angles, which provides a rich well of possibilities for interpretation. Instead of assuming any 'outcomes' or 'dependent variables' to be explained with a set of 'independent variables', this study simply refers to different

categorisations of the data, without terminologically predefining the relationship of any category to the other ones.

Model 3. Hermeneutic Approach

Categories to be examined: A/a, B/b, C/c, D/d

Analysis 1a. A/a, B/b, C/c ~ D

Analysis 1b. A/a, B/b, C/c ~ d

Analysis 2a. A/a, B/b, D/d ~ C

Analysis 2b. A/a, B/b, D/d ~ c

Analysis 3a. A/a, C/c, D/d ~ B

Analysis 3b. A/a, C/c, D/d ~ b

Analysis 4a. B/b, C/c, D/d ~ A

Analysis 4b. B/b, C/c, D/d ~ a

Where:

- A/a, B/b and C/c refer to dichotomous variables (capital letter indicating that a certain condition is relevant for the case, and lower case letter indicating the category is not relevant for the case).
- ~ refers to an INTER-RELATEDNESS between the categories

Instead of conducting one analysis, the use of QCA could be described as a process where several analyses, at various levels and with different categories to be examined follow each other, resulting in revisions of categories and the understandings of the cases throughout the process. At best, the process resembles a hermeneutic circle where understanding moves from entities (cases) to parts (categories) and back so that a higher level of understanding is reached at each circle of the spiral.

Since the categorised data is based on the researchers interpretations of the interviews, the new understanding of the cases that is achieved through the analysis could lead to having second thoughts on categorisation. This would affect the composition of categories, which would affect the resulting statements, which would affect the interpretations, and subsequently, the re-interpretation could go on and on. The next step would be to think whether the new understanding of the cases would lead to entirely new categories and new sets of analyses. This spiral could go on and on, depending on energy and imagination.

In fact, this type of QCA application corresponds with the dialogue between ideas (theory)

and evidence (data) which is characteristic of social research (Ragin 1994b), and which was selected as a guiding strategy for this research (see Section 1.4 and Fig. 1 on p. 10).

This research includes one of the first applications of QCA in forestry research, apart from some early trials of the author of this report (Hellström 1998a), work on the role of forestry in rural development in Europe (Ottitsch 2001) and work on deforestation by Rudel and Roper (1996). Moreover, in addition to some experiments conducted jointly with Rantala (Rantala and Hellström 2001), this research includes a pioneering application of the new hermeneutic approach to Qualitative Comparative Analysis.

4.1.2 Steps of Analyses

According to Janoski (1991), all comparative research explicitly or implicitly involves two different kinds of analysis. Internal analysis refers to the analysis of one case. External analysis concerns the comparison of cases (a) initially before the internal analysis has been started, and (b) the comparison of cases through more formal methods of analysis after the internal analysis has been completed.

As a whole, the methodological path from evidence to resulting ideas is summarised in Fig. 5. The upper part of the figure, the internal analysis of the cases, resulting in case descriptions, is already described in Chapter 3. Actually, this whole phase of internal analysis may be viewed as a means to construct categories for further external analysis with QCA.

As can be seen from Fig. 5, categorisation of data into truth tables is a crucial ‘cut point’ for the research: it marks the end of the internal analysis, and the beginning of both sets of the external analyses (for details on categorisation, see Section 4.2.1).

The purpose of the first phase of analysis with QCA – the empirical typology approach – was to condense the data, organise it into more structured wholes, and improve conceptualisation of the data (see Model 2 in Section 4.1.1 and analysis in Section 4.2) for further analysis with the hermeneutic approach (see Model 3 in Section 4.1.1 and analysis in Section 4.3).

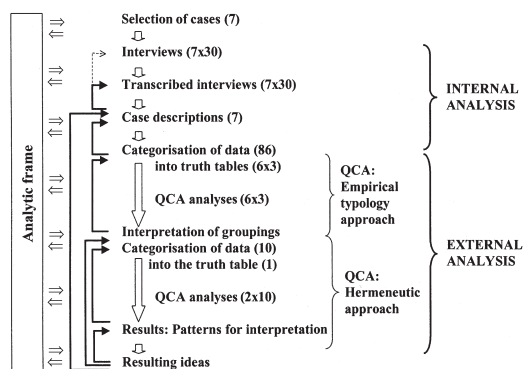


Fig. 5. The methodological path from evidence to resulting ideas.

Within the empirical typology approach, each of the six aspects of the analytic frame (see Section 2.2.2) was analysed separately from the point of view of each of the three dimensions of conflict (see Section 2.2.2). Accordingly, a total of $6 \times 3 = 18$ tables of data (so called truth tables) were constructed (Tables 1A–1F in Appendix 5), and one analysis was conducted on each truth table (results in Tables 2A–2F in Appendix 5).

From the groupings provided by analyses with the empirical typology approach to QCA, and subsequent interpretation, a total of ten categories were constructed and formed into one single truth table. This truth table was then analysed from $2 \times 10 = 20$ different angles, as illustrated by Model 3 in Section 4.1.1. Instead of just trying to group the cases in new ways, the main focus in further analysis with the hermeneutic approach to QCA was the examination of how the different aspects of the conflicts are related to each other.

In practice, the categorisations and two different sets of analyses with QCA (empirical typology approach and hermeneutic approach) did not constitute a linear process, but followed each other in a continuous circle, during which new understanding of the images of the cases resulted in revisions of categorisations and new analyses (see multitude of feedback systems in Fig. 5). During this process, it was even found useful to revise the analytic frame itself (see left in Fig. 5; for revision of the analytic frame see Section 2.2.2).

4.1.3 Technical Choices

Contradictions occur when two cases are similar to all other categories except the one to be analysed. The computer programme cannot handle these situations. Ragin (1987) suggests that when contradictions occur one should, whenever possible, return to the original truth table and try to construct a new, non-contradictory one. When this is not possible the researcher might code all contradictory categories in a similar way, or import frequency or statistical criteria to the truth table. Although the reconstruction of the truth table may give more insight to the data, these approaches still have an underlying assumption that the 'final' truth table should not consist of contradictions. This is why a 'better' truth table has to be constructed.

In the empirical typology approach, contradictions do not exist because all cases are given the same artificial outcome category 'EXIST'. In the hermeneutic approach to QCA, if all cases differ from each other in at least two categories, the information in the truth table cannot be condensed at all. If the cases differentiate in one category, contradictions are unavoidable since each category is, in its turn, analysed in relation to all others. As logical relations are studied instead of causal ones, there is no theoretical reason to demand that contradictions should not occur in the data.

Although contradictions are not a theoretical problem in the analysis, a strategy was needed for dealing with them. When contradictions occurred, two subsequent analyses were conducted. The first analysis only treated the case receiving the 'capital letter value' for the contradictory category. In the second analysis, the case receiving the 'lower case letter' categorisation was included in the analysis. By conducting the analysis in two parts, both contradictory cases were included in the way that they were originally categorised. Instead of losing information, this strategy actually provided new interpretative possibilities, such as ideas about the differences between the 'contradictory' cases. That two cases differed only in one category was not a problem, but a piece of information.

Another technical problem often related to QCA analysis is the so-called counterfactuals.

Counterfactuals refer to such combinations of categorisations that are logically possible but not present in the data. For the QCA analysis to be technically possible these 'missing cases' have to be accorded hypothetical 'outcome values' and they have to be included in the analysis. In the empirical typology approach, no problems with counterfactuals exist. The use of the artificial category 'EXIST' itself already defines all cases that are not in the data as having the complement value of 'exist'.

In the hermeneutic approach, the computer program was given the freedom to make such assumptions about the 'missing cases' that would make the resulting statements structurally as simple as possible. This was the only practically possible way to proceed. Having to define values for counterfactuals in hundreds of analyses that were conducted would have been an impossible task. This is not considered as a theoretical problem, as real cases can be found to support each resulting statement derived (see Rantala and Hellström 2001).

When using a modern PC, a maximum of 10 categories at a time can be effectively analysed when using the Quine-McCluskey minimisation algorithm, which is the most reliable one. The empirical typology approach only used a maximum of five categories in each analysis, so this was not a problem. However, in the hermeneutic approach, there was a need to treat more than ten categories in the same analysis. The Akers algorithm can effectively treat up to 13 categories at a time. Although there was a temptation to use this algorithm, it proved to offer a poor basis for interpretation because, with a large number of categories, it did not always provide the most minimal solution. After some experimenting, it seemed obvious that the data – 13 categories for 7 cases – would not minimise enough to provide a fruitful basis for interpretation, regardless of the algorithm used. Accordingly, the Quine-McCluskey algorithm was also chosen for the hermeneutic analysis, although it meant having to reduce the maximum amount of categories used in one analysis to ten.

4.2 Empirical Typology Approach for Grouping the Cases

4.2.1 Categorisation

The process of dichotomising, that is the process of dividing into two groups, is not easy. In the data, most characteristics apply to every case in some respect. By marking these aspects as characteristics that differentiate the cases, the aim is to distinguish those cases where a specific characteristic is especially meaningful in terms of the forestry conflicts. That is, instead of saying that a characteristic exists in a case, the aim is to indicate that it is more important in some case than others. Often, the categories only mark a slight distinction between 'more' and 'less'.

The reader should be aware that he might find inconsistencies between the case descriptions (Section 3.2) and the categories used in the truth tables (Tables 1A–1F in Appendix 5). This is due to the fact that the modes 'more' or 'less' given to each category cannot be based on the description of any single case, but on a comparison of all cases. For example, according to a description of one case, the conflicts may seem as rather intense, and the reader might expect the mode 'more' for the category 'intensive' in relation to this case. However, after comparing all cases, the conflicts in some other cases could have been found to be significantly more intense, and therefore the mode 'less' might have been chosen to describe the initial case. Accordingly, the coding for each case has to be considered in relative terms.

The relativity of each category is illustrated by the fact that the appropriate coding may not always open up until the analyses. In fact, the categorisation presented in Tables 1A–1F in Appendix 5 is a result of hundreds of analyses with QCA in order to find out the most informative combinations of categories and modes. The categorisations are made in such a way that they provide the researcher with a logical and comprehensive understanding of the data as a whole, while simultaneously supporting the understanding of each individual case.

The difficulty of assigning modes for the categories is illustrated through the following example. Keltner's (1990) model of the struggle

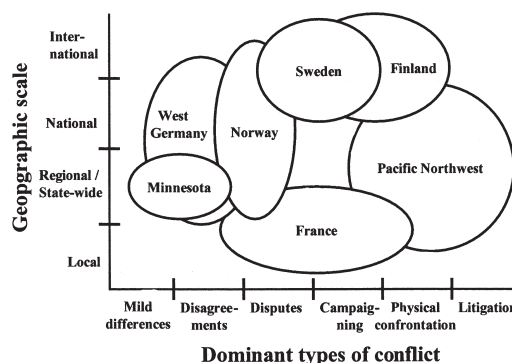


Fig. 6. The geographic scale of major actors and the dominant types of action in environmental conflicts in forestry in Finland, France, Minnesota USA, Norway, Pacific Northwest USA, Sweden and West Germany in 1984–1995.

spectrum (difference, disagreement, dispute, campaigning, litigation, physical confrontation (see Section 2.2) offers a fruitful basis for categorising conflict intensity. If the geographic scale (international, national, regional, local) is added to the intensity of the conflicts, Fig. 6 can be drawn as a first step towards categorisation.

The application of the QCA method implies that any aspect of the conflicts has to be described by using only two modes. Should the line between mild and intense conflicts be drawn between Finland and Pacific Northwest and the other cases or, for example, between Minnesota, West Germany and Norway and the other cases? Although the process of categorisation can be guided by theory, the drawing of lines between categories can finally only be done through an interpretative process of using QCA in experimental ways. If one line drawn between cases offers more interpretative potential than another, then it should be preferred.

Not all interesting characteristics of the conflicts could be categorised and formed into a truth table to be analysed with QCA. In some cases, sufficient and corresponding data was not available from all the country descriptions. This is one disadvantage of using focused interviews. Also the fact that the analytic frame was revised during the analysis, resulted in a situation where the data could be categorised more consistently from some perspectives than others. Moreover,

the categories represent very different types of elements: facts, meanings opened up by the interviewees, and the researcher's interpretation of the data, based on theory and experience.

The relationship between the number of cases and number of categories also affect the interpretative possibilities of the results. Having seven cases in total, the suitable number of categories to be used in one analysis when using the empirical typology approach was four or five. With fewer categories, the use of QCA did not provide the researcher with much more insight than just by looking at the raw data. With the use of more categories, variation between the cases grew to such an extent that the data did not easily minimise in the QCA analysis.

A total of 86 dichotomous categories were used to describe seven cases. Accordingly, the analysis is based on $86 \times 7 = 602$ individual choices of dichotomous categorisations. Although each individual choice cannot be explicated in detail, some indication of how lines were drawn is given in Appendix 3. Moreover, the interpretations made for the chosen categorisations only present one possible interpretation of the data – the interpretation that arose from the researcher's experiences and knowledge of data and theory. Accordingly, the categorisations have substantial meaning only to the researcher who is familiar with the whole data.

4.2.2 Types of Conflict

In order to be easily grasped by the reader, only the basic principles of categorisation and the results summarised into visual form are presented in this section, whereas the truth tables and tables of results are presented in full in Appendix 5. When describing the results, the codes presented in parenthesis in lower case letters refer to categories of the truth tables (1A–1F), whereas capital letters refer to groupings in the tables of results (2A–2F).

Conflicts are extremely complex phenomena. The conflict types are here categorised from three perspectives: conflict themes (substantial aspect), conflict intensity (procedural aspect) and conflict actors (relationship aspect). This is adopted from the conflict model presented by Walker and Dan-

iels (1997, p. 22). In order to ensure that conflicts are analysed in a compatible way, and from sufficiently different types of aspects, this model is used as a basis for categorisation also when analysing all other elements of the analytic frame.

Conflict themes. For describing conflict themes, five categories is rather few; issues even in a single conflict tend to be extremely complex. In relation to the pure environmental functions of forests, a division was made between the dominance of conflicts related to forest protection (a1) and forest management practices, with particular emphasis on the level of forest utilisation (a2). The other categories chosen for the analysis describe the social dimensions of conflict issues: social impacts of forest protection (e.g. employment, regional economy, a3); amenity use of forests (a4); and private ownership rights (a5).

Conflict intensity. The intensity of conflict is one of the most difficult aspects to evaluate, particularly when comparing conflicts that occur in different types of cultural settings. Should conflict intensity be categorised according to the type of actions taken by different conflict actors, or should conflict intensity be measured by how different actors experience these actions? Although the latter alternative is more tempting, the interview data was better suited for building categories on the type of action than on the personal experiences of the interviewees. For the analysis, categories modified from Keltner's model (1990, see Sections 1.5.2 and 4.2.1) were used. The existence of on-site protests (b1), litigation (b2), and strong campaigning (b3) was rather easy to detect from the empirical evidence. However, it did not offer much ground to differentiate between differences, disagreements and disputes. Therefore, only one category (b4) was used to represent all the 'milder' types of conflicts.

Conflict actors. In all cases, conflict actors involved the national environmental and forestry organisations. Therefore, the degree of involvement of different actors from these groups was difficult to categorise. Most differences were found regarding the involvement of international environmental interests (c1), the forest industry (c2), and the different administrations (c3). Therefore, these groups were used as basis for the categorisations. Two additional categories, involvement of the media (c4) and diversity

of interests (c5) were chosen to represent the involvement of other than pure forestry or environmental interests.

The results of the QCA analyses are summarised in Fig. 7 so that each box drawn around a set of cases corresponds to a grouping suggested by one row of the table of results (Table 2A in Appendix 5). In this way, the figure is a one-to-one illustration of the table of results. A box suggests that the cases within it differentiate from the cases outside it in some relevant aspect. Different types of lines are used to indicate whether the aspect of interest is related to the substance, process, or relations dimension of the conflicts.

The summary of results of the QCA analysis on the types of conflict (Fig. 7) indicates that the types of conflicts can be grouped in ten different ways, as indicated by the number of boxes in the figure. However, several boxes overlap to the degree that they can be interpreted jointly. These joint groupings, indicated by arrows in the figure, form the basis for the further comparative hermeneutic analysis with QCA (Section 4.2.1), and are described below.

Group 1 (Fi, PN). Finland and the Pacific Northwest appear similar in all aspects of conflict types: intensity, themes and actors (regarding all aspects, they are located in the same box). Concern for the social impacts of increased forest protection (A1, a3), and accordingly, intense conflicts with frequent on-site protests and campaigning (B1, b1) strongly feature in both cases. Conflict themes in these two cases have been slightly different in regard to the level of litigation involved in the conflicts (b2), and in relation to the harvest level (a2) as a conflict theme.

Group 2 (Fi, PN, No, Sw). In relation to actors involved, Finland and the Pacific Northwest share similarities with two other cases: Norway and Sweden. They all share media interest in the strong tension between external environmental pressure and industrial interests (C1). In Finland, Norway and Sweden, external pressure originates from customer countries in Central Europe, whereas in the Pacific Northwest, external pressure mostly originates from other states on the East Coast of the USA. The media, and accordingly, also the general public are major actors in the conflicts. An important difference related to the forest industries is that the industry mostly

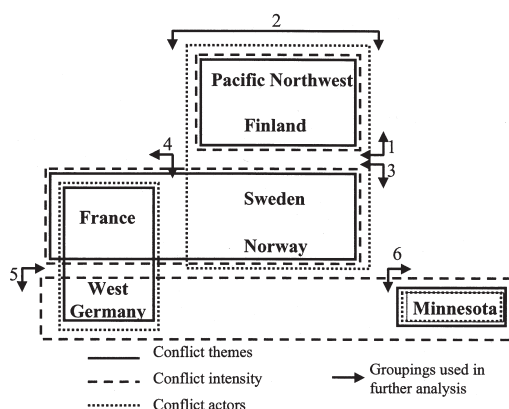


Fig. 7. Grouping of the cases according to conflict types.

involved in Finland, Norway and Sweden is the concentrated pulp and paper industry, whereas in the Pacific Northwest the sawmill industry has been involved more strongly than the pulp and paper industry.

Group 3 (Fr, WG, No, Sw / Fi, Mi, PN). In the table of results, France, Sweden and Norway appear similar in some respects (A2, B2). However, France seems to have even more important aspects in common with West Germany (A3, C2, see Group 4) than Norway and Sweden. Although these four countries form a rather heterogeneous group of cases, they still share some important similarities: little on-site struggles (B2, B3); and little debate on the social impacts of increased environmental protection (a3), the role of public forestry (a5), or the level of forest utilisation (a2) (A2). There are differences within the group, too. Conflicts in Sweden and Norway share a similar type of forest protection debate with Finland and the Pacific Northwest (a1), with some similarities regarding conflict actors (C1). However, in Sweden and Norway, the social impacts of environmental protection (a3) were not discussed to the same extent as in Finland or the Pacific Northwest. West Germany and France differ from the other two cases of this group by not having significant conflicts over the protection of old-growth forests (a1).

The so-called complement group (Finland, Minnesota and Pacific Northwest) differs from the other four cases particularly in relation to conflict themes. In Finland, Minnesota and Pacific

Northwest, the role of public forestry (a5, A1–A4) has been a clearly more important conflict theme than in the other four cases. More generally, conflict themes in Finland, Minnesota and Pacific Northwest include at least one of the two major themes of debate with socio-economic implications: the level of harvest and the social impacts of forest protection (a2, a3).

Group 4 (Fr, WG). Conflicts in West Germany and France resemble each other mainly in respect to conflict actors and themes. Instead of debate over forest protection, both countries have primarily struggled with traditional forest management issues (a1), and administrative struggles over competencies (C2). The fact that administrative struggles appear dominant may also be one indication of a situation where there are few other interests than forestry or environmental involved in the conflicts (a3, c1, c2, c5).

Group 5 (WG, Mi). West Germany and Minnesota represent somewhat milder types of conflicts than the other cases. The cases were characterised by the low number of physical on-site protests or campaigning (B3, b4). It is interesting that both cases fall into different groups concerning the themes and actors involved in the conflicts. Although this grouping does not exist elsewhere in the analyses in exactly this composition, it is a very interesting grouping for further analysis. It offers a possibility to analyse the variety of circumstances where mild conflicts exist, regardless of themes and actors involved. Moreover, this grouping is interesting because it suggests that the intensity of conflict may not be as closely tied to themes and actors as generally believed.

Group 6 (Mi). Although Minnesota has slight similarities in some aspects with several of the other cases, it appears rather different from the other cases in most respects. A feature specific only for Minnesota is the significantly stronger focus of conflicts at the level of forest utilisation (level of harvest) than on any protection of forest management issues (A4). Moreover, conflicts involve a theoretical debate over regulation of private forestry and amenity use of forests. The latter aspect is also illustrated by another feature typical of Minnesota: the strong involvement of diverse interests (e.g. recreation, hunting) in the environmental forestry debate (A4, C3).

Fig. 7 has many similarities with Fig. 6 presented earlier (p. 42). Although this figure was not constructed using the geographic scale of actors as individual categories, geographical aspects are present in at least two categories: the social impacts of environmental protection (local dimension); and the involvement of environmental interests external to the region (international or inter-state dimension).

For the comparative hermeneutic analysis to be conducted later in this research (Section 4.3.2), some interesting questions arise from the groupings presented above:

- To what extent are the similarities in the types of conflicts between Finland and the Pacific Northwest related to similarities in conflict management approaches, or similarities in the value, policy, economic and resource aspects of the conflicts?
- The Nordic countries (Finland, Norway and Sweden) can be expected to have many similarities in the social, economic, political and resources aspects related to forestry. Why are the types of conflicts in Finland so different from those in the other Nordic conflicts?
- What do the mild conflicts in West Germany and Minnesota have in common? Can the mild nature of these conflicts be understood in the light of social, economic, political or resources aspects, or are they, perhaps, a result of conflict management approaches?

On the basis of the hermeneutic interpretation of the comparative results, an attempt is made to answer these questions (see Section 4.3.3).

4.2.3 Social Aspects of the Conflicts

Owing to more narrow and value-oriented scope of social aspects in the analytic frame used for material collection than in the analytic frame used for data analysis, the categories presented below focus more strongly on value aspects of the conflicts than on other social aspects. This problem is slightly reduced by the fact that some of the values involved are related to social aspects.

Studying value dimensions and the way in which different values related to forests contradict in conflict situations is an important basis for most conflict research. It is also the most dif-

difficult aspect of the conflicts to study. This study, for example, involves a variety of different conflict situations over 12 years. The values related to these conflicts are not possible to measure directly, nor is there sufficient literature to cover the field, although literature may be used to support ideas and fill in gaps in the interview material. The categorisation is made according to three aspects: value dimensions (substantive aspect); value communication (procedural aspect); and relation with others (relationship aspect). Particularly the value communication and relationship aspects overlap to a significant degree, which is only to be expected: relationships are greatly affected by forms of value communication.

Value dimensions. The categorisations presented below are largely based on the interviewees' views on the importance of different value dimensions in the conflicts. Rather than indicating if a specific value dimension within a case is strong or not, the interviews reveal which value dimensions have had most impact on the conflicts. Moreover, if conflicting values have been dealt with in a constructive manner at an early phase of a conflict, it is possible that even some strong values have not come forth in the interview material. Value dimensions investigated include: environmental values and their fragmentation (d1); economic values of forests (d2); social values regarding community and local environment (d3); private ownership rights (d4); and amenity values of forests (d5).

Value communication. Although it is essential to be aware of the diversity of forest values, a major concern in conflict research is how values are communicated. Value communication makes the conflicts 'visible' so that they become perceived as social problems needing resolution. Value communication is not only perceptible in verbal interaction (e.g. rhetoric of various communication systems, see Koch and Kennedy 1991), but also in behaviour (e.g. decision-making and co-operation). Categories used in the analysis include a mix of both aspects, and are divided into: professional traditionalism and degree of isolation (f1); communication through practice, e.g. co-operation (f2); communication of environmental values by the forestry profession (f3); acceptance of professional diversity (f4); and organised resistance towards environmental-

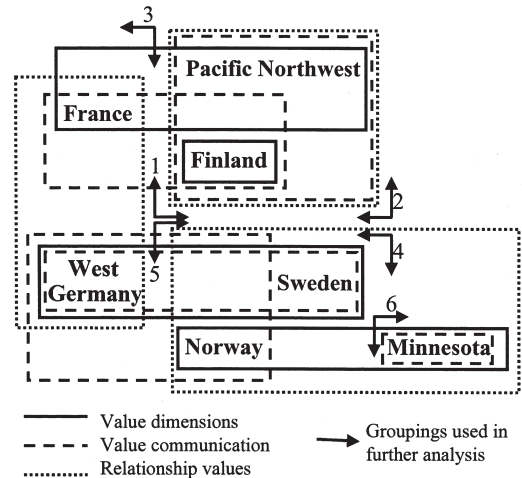


Fig. 8. Grouping of the cases according to the value aspects of the conflicts.

ism (f5).

Relation with others. Keltner (1990) refers to the goals of including, excluding or eliminating each other as one means of identifying conflict types. Indeed, aspects related to the relationship between conflict partners (e.g. attitudes and behaviour towards each other, and the tolerance of other's views) are the third important value aspect of conflicts analysed here. In general, an attitude change from excluding to including each other has taken place in many organisations within the forest sector especially during the early 1990s. However, the pace and extent of such developments in the different cases vary. The categorisation used includes: the use of dialectic processes to understand each other (e1); practical co-operation between different interests (e2); communication and close relation with the public (e3); participatory policymaking (e4); and resolving differences through litigation (e5).

The results of the QCA analysis indicate that resource aspects of the conflicts can be grouped in six different ways (Fig. 8).

Group 1 (Fi, PN). In one aspect, the grouping of the cases according to conflict related values and value communication resulted in a similar setting as when grouping the cases according to conflict types in the previous section. Again, Finland and the Pacific Northwest were strongly differentiated from other cases. In both cases,

instead of open dialogue, values were communicated rather indirectly, through formal processes (policies and/or planning) or through public discussion in the media (E1). Therefore, it is no surprise that the cases also appeared rather similar to each other with respect to the existence of rather polarised relationships between conflict actors (C1).

In Finland and the Pacific Northwest, strong clashes of values were detected. However, the cases showed slight differences in the value dimensions involved in the conflicts. In Finland, rather homogeneous environmental values were contrasted by high national economic importance of forests, and strong values related to the right of local communities to live off their forests (D4). This polarisation of environmental and community values is also more than true for Pacific Northwest, but such polarisation was strengthened by a very fragmented environmental movement and strong amenity values of the residents immigrating to the area (D3).

Group 2 (Fi, Fr, PN). Finland and the Pacific Northwest also had similarities with France. All three cases involved struggles related to community values (D3, D4, d3), and in all three cases value communication was less dialectic and co-operative, and more directed towards the public than in the other cases of this study (E1, E2). Despite these similarities, France was also rather different from Finland and the Pacific Northwest in some respects related to values. France differed from Finland particularly in relation to the role of economic and amenity values in the conflicts (D3, D4). France differed from the Pacific Northwest particularly in the lesser use of official channels of value communication, such as policy and judicial processes (E1, E2, e4, e5).

The group consisting of the remaining four cases (WG, Mi, No, Sw) can be considered as a complement group. Although the group does not appear particularly interesting, a few similarities can be found between these cases. The environmental movement in these cases is not very fragmented and community based struggles have been fewer than in the other cases (D1, D2, d1, d3).

Group 3 (Fr, WG). France and West Germany are joined by long traditions of the forestry profession (f1), which seemed to set a frame

for many other similarities in the relationships between different sectors. In both cases, foresters promoting nature-oriented forestry were organised into associations, which were rather well accepted by the forestry profession at large (f3). These groups may have formed a channel of communication for environmental values in a way that has reduced the communication between the foresters and environmentalists through other channels. Namely, although the forestry profession was rather heterogeneous, in both cases, it had rather distant relationships with environmentalists. This was also visible in the relationships between administrations (c3). However, France and West Germany appeared different in relation to value dimensions and communication channels. In these respects, France mostly resembled the Pacific Northwest (see Group 2 above), whereas West Germany resembled Norway and Sweden (see Group 4 below).

Group 4 (WG, No, Sw). West Germany, Norway and Sweden formed an interesting group, which seldom appeared in exactly this combination of cases when experimenting with different coding. Nevertheless, it was a rather evident group, based on the fact that these three cases very often combined as pairs of cases. Most often, West Germany was connected to either Norway or Sweden. As will be noticed later, Norway and Sweden were also very similar in many respects. In relation to value dimensions, West Germany was similar with Sweden in the lack of open value conflicts (D2). Surprisingly, however, in relation to value communication these cases were found rather passive in relation to other cases (E3). West Germany also shared similarities with Norway in the respect that formal channels, such as policies, planning and the judicial system did not appear as important channels of value communication (E4). It is interesting to note that this group is also a subsidiary group to the complement of Group 2.

Group 5 (Mi, No, Sw). Norway, Sweden and Minnesota, resembled each other in many respects. Even when experimenting with slightly different coding, some connections were usually found between these cases. The value dimensions involved in the conflicts were rather similar in the respect that little conflict pressure originated from strong community values or from a fragmented

environmental movement (d1, d3). Within this setting, strong amenity values were an additional feature characteristic to Norway and Minnesota (D1). Moreover, as already mentioned, the lack of open value conflicts was typical for Sweden (D2).

Considering these similarities in values, it is not surprising that these three cases all had rather mixed working relationships (F3), with professionals with different background working together also in the major organisations that had been attacked by the conflicts. In Minnesota and Sweden, constructive relationships between different actors were strengthened by dialectic processes and value dialogue related to major policy reforms (e4). In Norway, the constructive relationships were strengthened by co-operation between groups (e2, f2).

Group 6 (Mi). Minnesota was most closely connected to Norway in relation to value dimensions and relationship values (D1, F3). However, in relation to value communication, it appeared rather different from all other cases (E5). Value communication in Minnesota included multiple channels, both official and unofficial. Because of this, there was no particular need to use communication towards the public as a channel for reaching other interest groups.

An interesting notion can be made from the groupings: in many respects, West Germany represented a rather neutral case. This was visible in the fact that when conducting the analysis with different coding, West Germany was often grouped together with several other cases. An interesting notion regarding the value dimensions of the three cases of Group 5 (Mi, No, Sw) is the fact that a large proportion of the population in Minnesota originate from Scandinavian countries. This was also recognised by many Minnesotans who claimed that the mild nature of conflicts in their state has something to do with 'Minnesota Nice' – a popular proverb that is said to refer to the Scandinavian origin of many Minnesotans. Although this notion cannot be tested with the data from this research, it may be an interesting idea to be followed in other cultural research. Some interesting questions that might be answerable in the hermeneutic analysis following in Section 4.3.2 (for answers see Section 4.3.3) include:

- Finland and the Pacific Northwest appear very similar, not only in relation to conflict types (see previous section), but also in relation to value aspects. How decisive are value aspects for the occurrence of such intense conflicts as in these two cases? Vice versa, to what degree can intense conflicts be avoided with constructive communication of values?
- Why does Finland appear very different from the other Nordic countries?
- Is effective conflict management possible in situations with infected value conflicts? Are conflict management strategies chosen on the basis of present relations between different groups, or are they designed to improve such relations?

4.2.4 Policy Aspects of the Conflicts

The categorisation related to policy aspects of conflicts is made according to three aspects: policy substances (substantive aspect), policy processes (procedural aspect) and policy participants (relationship aspect). Regarding overall policy strategies, the use of policy means and the participants of policy processes, literature is available to support the ideas presented in the interviews. Thus, policy aspects are easier to categorise than, for example, value aspects. Yet, it is not easy to categorise the data in a manner that is both sufficiently reliable and compatible.

Policy substances. Policy strategies and substances are important issues of debate in most forestry conflicts. Policy substances are considered here to include the overall strategies related to forestry and environmental protection (g1), including aspects such as the overall goals of forestry and environmental policies and their relation to each other. More particularly, the categories used focus on: environmental legislation (g2); policies on forest protection (g3); the treatment of different forest functions in forest legislation (g4); and the level forest management regulation (g5).

Policy processes. Policy processes are referred to here as processes that are related to designing policies and implementing them through the use of different policy means. Categories of interest include such processes of policy reform that focus on: norms related to forest management (h1);

goals of public forestry (h2); or the use of financial means (h3); or information means (h4). These aspects are supplemented with a category describing policy implementation (f5). Even if there is agreement between interest groups on policy goals and means, the implementation of a policy does not necessarily reflect such underlying goals, owing to, for example, the attitudes of the implementers, technological and economic constraints, pressures from various interest groups opposing the policy, or contradictory goals of various policies.

Policy participants. The types of participants involved in policy processes vary greatly among the cases of this study. Yet, in all cases, most forestry organisations were traditionally strongly involved in various policy processes. Therefore, the categories only focus on those groups where the differences among cases were most apparent: political parties (i1); administrations (i2); environmental NGOs (i3); the general public (i4); and scientists (i5). To some extent, the scope of policy participants reflects the openness of policy processes. The multitude of policy participants involved in policy processes also reflects the level of activity in the policy process to some degree. For example, when little pressure for policy revisions exists, participation in forest policy processes may not as easily raise into a conflict issue as in a situation with strong pressure for policy revisions.

The results of the QCA analysis indicate that policy aspects of the conflicts can be grouped in six different ways (Fig. 9).

Group 1. (Mi, PN). Minnesota and the Pacific Northwest form a pair of cases, which resemble each other in relation to policy substances, but appear slightly different in relation to policy processes and participants. In relation to general structures and goals of forest policy, they share dispersed environmental legislation and policies, and the lack of multi-goal forestry legislation (G2). An interesting feature in common, which did not appear as a basis for any groupings was the strong involvement of the scientific community in policy processes (i5).

Group 2. (Fi, Mi, PN). In relation to policy participants, Finland, Minnesota and the Pacific Northwest share the involvement of multiple interest groups and the public at large in official

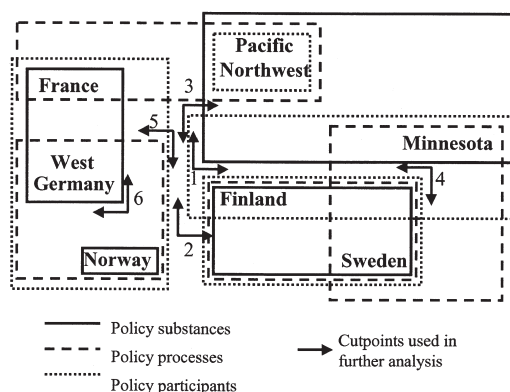


Fig. 9. Groupings of cases according to policy aspects.

processes (I2, I3, i3, i4). Interestingly, however, in relation to policy processes, each of these cases is grouped differently (H1, H2, H3).

Group 3. (Fi, Mi, Sw). Finland and Sweden are grouped similar in all three aspects: policy substances; processes; and participants. In both countries, the level of forest protection and regulation in forestry were debated within a setting of a rather wood production oriented policy (G3). This setting also led to major policy reforms (H2), with participation of multiple interest groups and co-operative forestry and environmental administrations (I1, I2). Finland and Sweden also appear similar to Minnesota in that they share reformatory policy processes (H1, H2) participated by multiple interests without party political tension (I1, I2).

Group 4. (Fi, Sw, No). The Nordic countries (Finland, Norway and Sweden) fall into the same group only in regard to policy substances. In the beginning of this study, none of these cases had modern forestry legislation with equality of the different aspects of sustainable development (g4). Yet, they all had comprehensive nature protection legislation, and a high level of protected forests (g2, g3).

Group 5. (WG, No). Although France and West Germany were similar enough to be treated as a group of their own, West Germany also has many similarities with Norway. In relation to policy processes, they both share rather stable policies related to forestry legislation and public forestry, yet with development of incentives for

environmental management (H4). Moreover, in relation to policy participants, both cases have rather low level of involvement (I4). Partly, this may be a result of the interviewees not considering participation issues important in a situation where there is little pressure for policy change. Norway differs from West Germany in relation to forest policy goals. In Norway, struggles over the level of forest protection (g3) have been stronger and the forestry legislation has not included as broad goals (g5) as in West Germany (G1, G4).

Group 6. (Fr; WG). Both West Germany and France already traditionally have forestry legislation that, in principle, recognise the equal importance of economic, ecological and social functions of forests (G1, g4). Accordingly, new environmental demands have not contrasted the general principles of forest policy. Moreover, in neither country has the amount of protected forests been a major issue of policy conflict (g3). Therefore, the overall setting for forest policy is rather stable (H3, H4), with slightly more pressure on implementation of forest policy in France. The stable nature of policy is illustrated in the lack of large-scale policy processes aiming at major revisions of forest policy (h1). Owing to the stability of forest policy, the interviews also reflect a low scope of involvement in the policy process (I4). Partly, this may be due to the countries not having had any major policy reforms requiring the attention of wide interests during the period investigated.

For the hermeneutic analysis following in Section 4.3.2, some interesting questions (to be answered in Section 4.3.3) arise:

- In the summary figure (Fig. 9), the cases seem to form a continuum from the USA cases through the Nordic cases to the Central European cases. Are there any significant similarities between the two ends of this continuum (PN, Fr)?
- In all aspects studied, Norway is grouped differently from the other Nordic countries. How can this be understood in the light of the other societal aspects (e.g. value, economic and resource aspects) of conflicts?
- The grouping presented above resembles the grouping related to resource aspects of the conflicts (Section 4.2.6), to a large degree. Some similarities are also evident in relation to the economic aspects of the conflicts (Section 4.2.5).

What type of connection can be found between these two elements of conflicts?

4.2.5 *Economic Aspects of the Conflicts*

On the one hand, many environmental conflicts in forestry are affected by economic activities, or economic conditions. On the other hand, conflicts may have an impact on market processes by impacting the supply of and demand for raw wood and forest based products. Market aspects of conflicts have grown in importance particularly during the 1990s. This is especially due to increased communication of market values by both the environmental groups and forest industry. On this basis, the categorisation related to economic aspects of conflicts is made according to the economic environment (substantive aspect), economic processes (procedural aspect) and communication of economic values (relationship aspect).

Economic environment. From the point of view of environmental conflicts, the following structural aspects of the economic environment were considered relevant and selected as the categories used: the environmental sensitivity of product markets (j1); the level of export/import (j2); the structure of production (e.g. existence of regionally important wood markets, j3); the role of the forest industry in forestry (j4); and the importance of non-wood products (j5).

Economic processes. Conflicts are related to market processes and changes in the market structures in several ways. For example, conflicts may impact: the wood supply (k1); wood prices (k2); or the forest product market (k3). On the other hand, the profitability of forestry and of forest industries (k4) may have an identifiable impact on environmental consideration in forestry or the environmental debate related to forestry.

Communication of economic values. In all European case study countries, there is a long history of government intervention in the operation of the markets on the basis of various social needs. Yet, market intervention is today increasingly used by non-governmental organisations in addition to governmental organisations. Although many environmental benefits are not exchanged via markets, such exchanges can, to some extent,

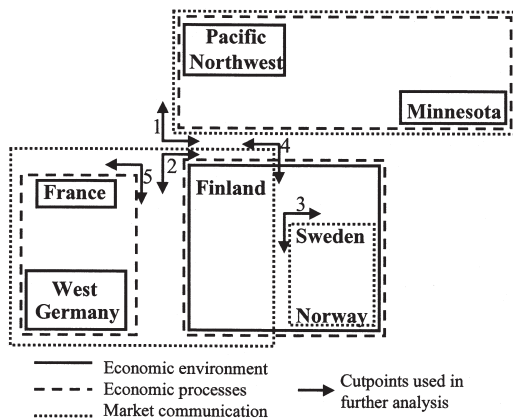


Fig. 10. Groupings of cases according to economic aspects of conflicts.

be created through communication of markets values. Both the environmental and forest sectors have been active in communication of market values. The issue of images is closely related to the markets of forest products and much of market communication is done in relation to forming images. This has happened through, for example: image campaigning (I1); hotspots (I2); previous experiences (I3); and certification (I4).

The results of the QCA analysis indicate that economic aspects of the conflicts can be grouped in five different ways (Fig. 10).

Group 1. (Mi, PN). Markets in the Pacific Northwest and Minnesota have not faced significant environmental pressure (J2, J3, K2). Accordingly, market tools in conflict management have not been used very much (L3). However, there is a slight difference between the market aspects of these two cases. Minnesota has important markets for non-wood products, at least regionally (j5). Another difference is the impact of conflicts on wood markets in the Pacific Northwest (k1) which, in this respects, resembles Finland to a large degree.

Group 2. (Fi, No, Sw). In the Nordic countries (Finland, Norway and Sweden), conflicts have occurred under pressure from international networks of environmental NGOs, within environmentally sensitive export markets (J1, j1, j2). Accordingly, the conflicts have greatly affected forest products markets (K1, k3). A difference between Finland and the other Nordic countries

is that in Finland, the conflicts have also had great impact on wood markets (k1). The two groups below illustrate a further difference between the Nordic countries.

Group 3. (No, Sw). The Swedish and the Norwegian forest sectors appear similar in relation to communication of market values (L1). For example, joint forest certification processes have been initiated (I4) rather than joint image campaigning, which has been done more by individual organisations than jointly.

Group 4. (Fi, Fr, WG). Despite significant differences in market environment and processes, Finland appears rather similar to West Germany and France in relation to market communication (L2). As a response to market pressure, these cases have launched intense joint image campaigns of the forest sector (D10). Not having positive expectations on market benefits (I3), joint certification initiatives, for example, were not made (I4).

Group 5. (Fr, WG). Most market pressure in West Germany and France is internal (J4, J5). For example, both countries have faced serious profitability crisis in forestry (K3). Particularly in West Germany, the low profitability of forestry has reduced conflict potential through a shift towards a more low-cost nature-oriented forestry. West Germany and France have some differences, too. For example, the German environmental movement is more active in international networking, which has made German environmentalists important actors in many of the conflicts related to forestry in the Nordic countries (K1), subsidies for environmental consideration have been increased, contrary to France (d9).

For the hermeneutic analysis following in Section 4.3.2, some interesting questions (to be answered in Section 4.3.3) arise:

- Market structures and conflict processes in the Nordic countries have been rather similar. Why does Finland differ from the other Nordic countries in relation to market communication?
- In relation to markets, the cases can be divided into three different main groups, according to geographic regions: the Nordic countries, the USA cases and the Central-European cases. This division is rather logical, for many reasons. How are geographical differences reflected in other aspects of conflicts?

4.2.6 Resource Aspects of the Conflicts

The structure of forest resources and forest management regimes in each country is not only the main issue of debate, but also affects the characteristics of the emerging conflicts. However, only a few categories relevant to all were found. One problem in categorisation is the potential of overlapping categories with aspects such as conflict themes, and economic aspects of the conflict. Resource aspects of conflicts are also viewed from three aspects: forestry structure and management regimes (substantial aspect); processes affecting forest use (procedural aspect); and forest users and traditions (relations aspect).

Forest structure and management regimes. The forest debate is in many cases bound to specific eco-geographical characteristics, such as the amount of: forest resources (m1); old-growth forests (m2); or protected areas (m3). Moreover, the management regimes or practices adopted for protected areas and parks (m4) and managed forests (m5) may be the prime substantial concern in environmental conflicts in forestry.

Processes affecting forest use. Forest structure and forest use may change as a result of conflicts either as a direct impact of protest on a specific site, or indirectly through changes in values, policies, markets, etc. The use of forest resources may be affected by processes that focus on: increasing forest protection (n1); changing public (n2) or private (n3) forest management practices; or changing harvest levels (n4).

Forest users and traditions. Forest resources are affected not only by changes in the values and policies of the society at large but also by traditions in forest use. Traditions are also closely related to: various public rights (o1); community rights (o4); or the rights of indigenous people (o3). Other types of traditional users of forests use examined here include users of non-wood forest products (o2) and industrial use of forests (o5).

The results of the QCA analysis indicate that resource aspects of the conflicts can be grouped in five different ways (Fig. 11).

Group 1. (Mi). Minnesota was grouped separately from all other cases in each of the analyses conducted. A feature characteristic particularly for Minnesota is little conflict over major resource aspects, such as forest protection or concrete

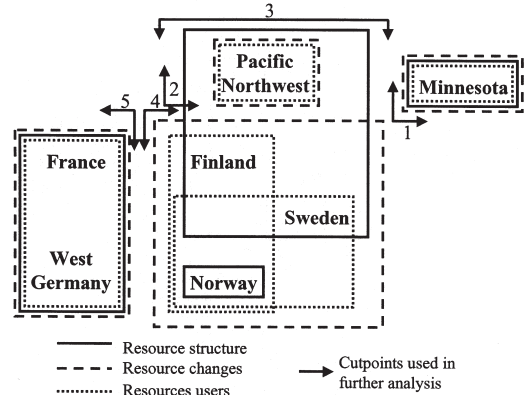


Fig. 11. Groupings of cases according to resource aspects of conflicts.

forest management issues (M4). Instead, conflicts included debate over changes in forest use, particularly the harvest level (N3, n4). Minnesota also has some resemblance with Pacific Northwest, as described below.

Group 2. (Mi, PN). The Pacific Northwest and Minnesota resemble each other in two important respects. They have both faced major changes in both public forest management and in the level of forest utilisation (N2, N3). In relation to conflicts, the Pacific Northwest has faced multiple and frequent changes in forest use. Simultaneously, harvest levels have increased dramatically in Minnesota. Moreover, multiple non-wood use and indigenous rights are also characteristic for these two cases (O4, O5).

Group 3. (Fi, No, PN, Sw). Finland, Norway, Sweden and the Pacific Northwest form a group of cases with rather little in common. Yet, they share one very important aspect of forest resources, which is among the major backgrounds to environmental conflicts in forestry: the existence of abundant unprotected old-growth forests (M1), and subsequently, substantially increased amounts of protection areas (n1, N1, N2). Moreover, all cases practise even-age management.

Group 4. (Fi, No, Sw). The Nordic countries, Finland, Norway and Sweden form a sub-group to group 3. However, they have stronger resemblance to each other than with the Pacific Northwest. In addition to increased protection, these cases have experienced significant changes in private forest management towards increased envi-

ronmental consideration (N1). The landscapes of these countries are formed through long traditions, of which public rights are important to note (O1, O2).

Group 5. (Fr, WG). France and West Germany are grouped together in all three analyses conducted. Thus, they resemble each other in relation to forest structure, management regimes, processes affecting forest use, and forest use traditions. Both countries lack unprotected old-growth forests, owing to long traditions of forest use. In relation to forest management regimes, they have uneven-aged management as one traditional forest management regime, and struggles over management of designated areas in common (M3). Changes in forest resources have been gradual rather than dramatic in both countries (N4). Moreover, forest use traditions lack public and indigenous rights (O3).

The figure related to resources (Fig. 11) is very similar to the figure related to economic aspects of conflicts. Also in this case, the cases are divided into three clear groups, according to geographic regions. In relation to the physical characteristics, this is natural for the Nordic countries and for West Germany and France, but not for the Pacific Northwest and Minnesota. For the hermeneutic analysis following in Section 4.3.2, this raises some interesting questions to be answered in Section 4.3.3:

- The role of the Pacific Northwest is interesting here, because it is the only case that has resemblance with cases in other geographic regions. How is this special position reflected in further analysis?
- Minnesota was grouped separately in all analyses. How are these special characteristics reflected in further analysis?

4.2.7 Approaches to Conflict Management

Again, based on the model of conflict management presented by Walkers and Daniels (1997, p. 22), the analysis of conflict management approaches is based on the division between substance management, process management and relations management. As conflict management is in this research viewed as an integral part of various activities related forestry, and not something

separate, many of the categories used are similar to those used in other analyses of the elements of the analytic frame.

Substance management. Substance management refers to attempts to manage conflicts with the use of substantial data, legitimisation, or proof. Substance management may include a variety of approaches, ranging from authoritarian judicial approaches (p1) to searching for scientific proof (p2), or to vigorous information dissemination and image campaigning (p5). Substance management can be viewed from another angle, too. Instead of trying to impact images or understanding of the substantial issues involved, substance management may aim at changing the substance itself through, for example, changes in forest management norms (p3) or practices (p4).

Process management. Process management refers to different ways in managing conflicts through impacting planning or decision-making processes related to forest use. These procedures can be institutional or voluntary. Institutional approaches include categories such as conflict resolution through committees (q1), or conflict prevention through public participation (q2). Voluntary approaches include working groups aiming at supporting policy reforms (q3, q4), or working groups on certification (q5).

Relations management. Relations management refers to voluntary approaches used to resolve specific conflicts (conflict mediation and arbitration, r1), or attempts to prevent conflicts by improving the relations between conflict actors. This can be done through systematic approaches of increasing dialogue (r2) and co-operation (r3), or it can take place through establishing everyday working relations between different interest through mutual employment (r4) or education (r5).

The results of the QCA analysis indicate that conflict management approaches can be grouped in seven different ways (Fig. 12).

Group 1. (Mi, PN). The cases from the USA (Minnesota and the Pacific Northwest) form a pair of cases with rather few similarities in relations management (R1, R5). However, they appear similar in relation to substance management. Both cases have tried to seek justification through science and the judicial system in conflicts. In

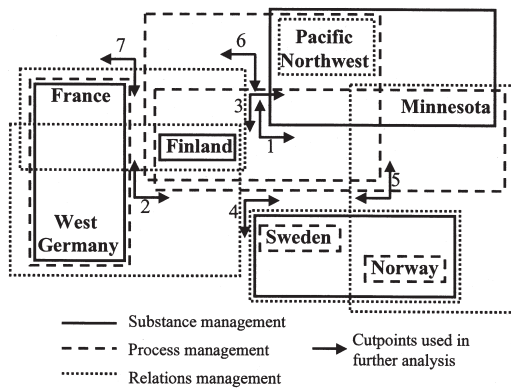


Fig. 12. Groupings of cases according to conflict management approaches.

relation to process management, the two cases are similar in strong emphasis on institutional and procedural conflict management (e.g. conflict management committees and public participation) (Q1, Q2).

Group 2. (Fi, Mi, PN). In relation to substance management, Finland is grouped separately from Minnesota and the Pacific Northwest. However, differences between these cases are small. All three cases have substantially stronger emphasis on justification and authorisation than the other cases of this study (P3, P4). Finland differs from the USA cases in having stronger emphasis on practical changes (p4) and less emphasis on using science in seeking justification (p2). Regarding process management, all three cases share strong emphasis on institutionalised conflict resolution: conflict resolution committees (q1) and public participation (q2). Regarding relations management, Finland has more in common with the Pacific Northwest than Minnesota (see Group 5).

Group 3. (Mi, No, Sw). Minnesota, Norway and Sweden appear similar only in relation to relationship management. All three cases are characterised by multi-faceted relations management (R1, R2), including: direct dialogue (r2); professional mixing (r4); and extensive education of the forest sector in environmental issues (r5).

Group 4. (No, Sw). Norway and Sweden form a sub-group of the group described above. Although Norway and Sweden have many similarities with Minnesota regarding relations management (see Group 3), they are grouped rather

differently from Minnesota in regard to substance and process management. Rather than authoritarian solutions or seeking justification (p1, p2), Norway and Sweden have sought internal changes within the forest sector as their strategy of substance management (P1, p4). Although Norway and Sweden are grouped separately in relation to process management, they share the use of a mix of both institutionalised and non-institutionalised process management through the markets, through joint interest group processes or policy reform (Q3, Q4).

Group 5. (Fi, Fr, PN). Finland, France and the Pacific Northwest resemble each other only concerning relations management. Whereas Finland and France have placed rather less emphasis on relations management (R4), relations management in the Pacific Northwest has had a rather institutional scope (R5).

Group 6. (Fi, Fr, WG). As a group, Finland, France and West Germany are not very different from Group 5 in sharing little or narrow focus on relations management. Problems in relations management in all cases of these two groups (5 and 6) are reflected in similarities in process management as well (lack of non-institutionalised process management, Q1, Q5). Finland, France and West Germany have one further feature in common, though. In relation to substance management, all three cases have emphasised joint information efforts focused outside the forest sector (P2, P3, p5).

Group 7. (Fr, WG). Also in the final analysis, France and West Germany appear very similar. In these cases, conflict management strategies are for the most categorised as having less emphasis than in other cases. This is true for substance (P2), process (Q5) as well as relations management (R3, R4). Here, it is important to note that the perceived low level of conflict management may, in part, be caused by rather mild conflicts particularly in West Germany.

An overall notion from the groupings is that although the analysis provides seven different groupings, none of these groupings is a 'new' one. That is, all combinations of cases have already appeared in previous analyses. Moreover, these groupings have significant overlapping. This pluralism well illustrates the pluralist and internal nature of conflict management in forestry. This

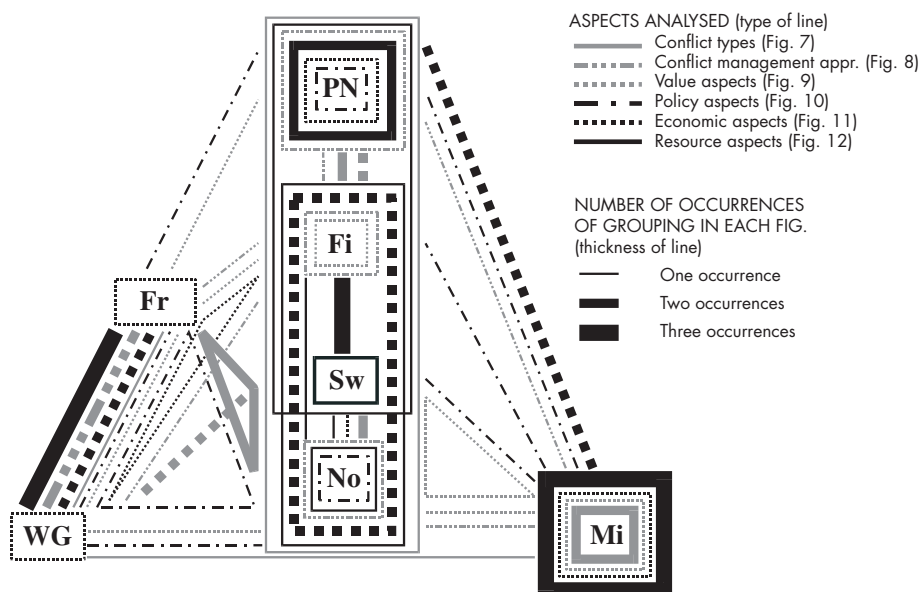


Fig. 13. Overview of number and type of connections found between the cases (Finland, France, Minnesota USA, Norway, Pacific Northwest USA, Sweden and West Germany) in Fig. 7–Fig. 12.

raises the question of how do the different dimensions of conflict management (substance, process and relations) coincide with the various conflict elements. For the hermeneutic analysis following in Section 4.3.2 (to be answered in Section 4.3.3), some interesting questions arise:

- To what extent do the groupings related to value communication coincide with groupings related to relations management?
- To what extent do the groupings related to process management coincide with policy or market processes?
- To what extent do the groupings related to substance management coincide with conflict themes or forest resources?
- There are significant differences in the level of conflict management in different cases. How are conflict management strategies reflected in the type and intensity of conflicts? Are mild conflicts consequences of active conflict management or do they appear despite the lack of conflict management?

4.3 Hermeneutic Approach for Comparing the Cases

4.3.1 Re-Categorising the Data

An obvious way to continue with the analysis would be to use the groupings presented in the previous section as new categories for further analysis. So far, the analysis has divided the seven cases into two groups in 30 different ways. This is significantly less than the mathematically maximal (63) way in which seven cases can be divided into two groups, suggesting that the various aspects of conflicts do not combine randomly but according to distinct social patterns. The aim of further analysis is to reveal these patterns.

The variation existing within the 30 new groupings resulting from previous analysis is illustrated in Fig. 13. It is drawn simply as a summary of all the groupings found in Fig. 7–Fig. 12 and by marking all of them in only one figure.

Instead of an organised whole, it was anticipated that the summary figure would look like a messy web including a significantly wider spectrum of variation. However, the summary figure could easily be drawn into the form of a triangle. A guiding question for further analysis is, there-

fore, do the scales of the triangle represent any logical dimensions that could be recognised and named?

From a substantial point of view, the figure raises additional interesting questions:

- The groupings related to the types of conflict and to the use of forest resources seemed to have many similarities (see France and West Germany; Minnesota; and the multiplicity of connections between the Pacific Northwest, Finland, Sweden and Norway). How decisive a factor is the resource structure and traditions of forest use for the type of conflicts?
- Conflict management approaches often seemed to be related to the value aspects of the conflicts (see Finland and the Pacific Northwest; West Germany and France; and Sweden, Norway and Minnesota). To what extent do values and the relationships between different conflict actors affect the choice of conflict management approaches? Do poor relations result in the use of relations oriented conflict management approaches or vice versa, and with what implications?
- Policy aspects of the conflicts occurred rather randomly in relation to the other aspects of the conflicts. Are policies really so unimportant in relation to the conflicts? Or, is there perhaps some connection between policy and economic aspects of the conflicts and West Germany; Finland, Sweden and Norway)? If so, can this be explained by some overall differences between the three geographical areas (Scandinavia, Central Europe and USA)?

In a single QCA analysis only 10 categories could be used for technical reasons (see Section 4.1.3). This means that the number of new categories (30) had to be significantly reduced. Technically, the frequency of the occurrence of each grouping in Fig. 13 could have been used as the basis for selection. However, frequency cannot be expected to be a relevant criterion for assessing the importance of a specific grouping. Another technical solution would have been to exclude all groups where only one case differed from all others (each of the seven cases were different from all others in at least some aspect). However, even then, $30 - 7 = 23$ categories would have been left for use in the analysis.

Instead of technical criteria, the significance of each category for the whole was evaluated

from an interpretative perspective, searching for meaningful ways to form joined categories. This was done by careful examination of the tables of result (the description below refers to Tables 2A–2F in Appendix 5).

Each individual analysis (A, B, C, ... , R) was examined and categorised separately. In some cases, two logical statements (e.g. E1&E2, H1&H2, I1&I2) contained significant similarities from an interpretative point of view and were, thus, formed into a new joint category. Moreover, if one logical statement proved to be complementary to another one (e.g. D3&D4 are complementary to D1&D2, and P3&P4 are complementary to P1&P2), they would be treated as two alternative modes of a single category. In order to lose as little information as possible during the process, special emphasis was placed in confirming that each logical statement presented in the tables of results (Tables 2A–2F in Appendix 5) was either treated as an individual new category, as part of a new category, or that it could be defined as being a complementary statement to some other statement.

When the resulting fourteen categories are joined in one figure (Fig. 14), the resemblance to Fig. 13 (p. 55) is still significant. The biggest differences occur in the corner on the left. The new grouping no longer recognises the multiple similarities between France, West Germany, Norway, and Sweden. This is explained by the fact that these cases form a complementary group to Finland, Minnesota and the Pacific Northwest. The categories presented in Fig. 14 are described in the following section.

4.3.2 Interpreting Conflict Cultures

Although getting closer, the data still needed to be condensed into ten categories instead of fourteen. The interpretation of the tables of results (Tables 2A–2F in Appendix 5) provided no further indication on how to condense the categories. Instead, it was done by examining the set of categories as a whole (Fig. 14), and through experimental analyses with several alternatives.

The categories used (1–10) in the final analysis and the categories excluded from the analysis (11–14) are all described below. For categories

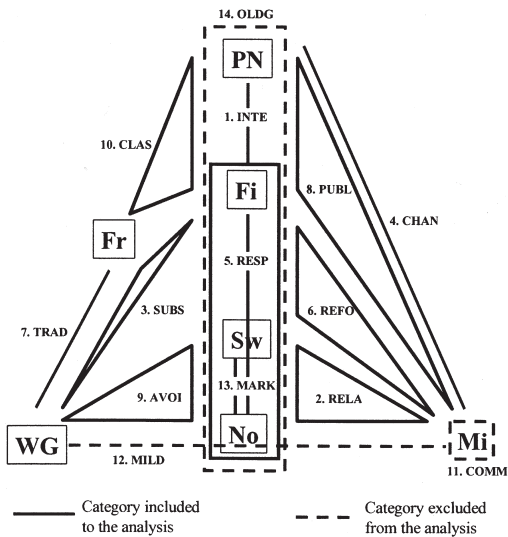


Fig. 14. Categories combining the cases (Finland, France, Minnesota USA, Norway, Pacific Northwest USA, Sweden and West Germany).

Abbreviations:

- 1 INTE: intense conflicts
- 2 RELA: constructive relationships
- 3 SUBS: substance oriented conflict management
- 4 CHAN: change in policy and resource use
- 5 RESP: responsiveness to market pressure
- 6 REFO: reformatory approach to policy
- 7 TRAD: stable policies in a traditional setting
- 8 PUBL: public forestry in focus
- 9 AVOI : avoidance of open value conflict
- 10 CLAS: clash of environmental and community values
- 11 COMM: communicative relations
- 12 MILD: mild dialectic conflicts
- 13 MARK: market communication
- 14 OLDG: external pressure on old-growth forests

1–10, the interpretation resulting from the analysis, and for categories 11–14, the reasons for exclusion from the analysis are also discussed. Although the interpretation is here presented in chronological order, the reader is encouraged to follow the leads given in the text, and follow their own paths of interpretation.

1. INTE: intense conflicts (Fi, PN). The category includes intense conflicts with frequent on-site protests and campaigning, and is characterised by environmental demands that raise

significant concern for the social impacts of increased forest protection. Moreover, a strong clash of ecological and socio-economic values that is typical for this category, is characterised by polarised relationships and either very formal or indirect value communication between the major conflict actors.

The analysis provides two major explanations for intense conflicts (INTE), both of which are closely related to relations between conflict actors. On the one hand, intense conflicts have occurred in cases with particularly strong clash of environmental and community values, combined with little focus on managing the relations between the conflict actors (CLAS). On the other hand, intense conflicts have taken place in situations with non-constructive relations between different conflict actors (rela). However, neither of these two characteristics explained the existence of intense conflicts alone. In both cases (Finland and the Pacific Northwest USA) they were combined with either non-stable policies in a non-traditional setting (CLAS*trad, rela*trad), or strong focus on public forestry and related participatory processes (CLAS*PUBL, rela*PUBL).

The four different statements describing intensive conflicts are not exclusive, but rather supportive of each other. This is also reflected in the fact that intensive conflicts in both cases (Finland and Pacific Northwest) have similar backgrounds; the intensity of conflicts appears to be more strongly related to relations than policy or market aspects. Indeed, considering these two cases, intensive conflicts occurred in rather different settings of policies and markets. However, it should be kept in mind that intensive conflicts only occurred in situations with strong external pressure on increased protection of old-growth forests (OLDG). Although this is an important background for intensive conflicts, the existence of old-growth forests does not necessarily involve intensive conflicts, as was the case in Norway and Sweden.

In the analysis, two alternative categories (publ, clas) were found to describe moderate or mild conflicts (inte). This suggests that mild conflict occurred in situations where no significant clash of environmental and social values existed (West Germany, Norway, Sweden, Minnesota), or where public involvement in public

forest management or policy processes was limited (France, West Germany, Norway, Sweden). The fact that Minnesota and France do not co-exist in these groups, and the fact that the analysis treats these categories as alternative suggests that mild conflicts may have several different backgrounds.

2. *RELA: constructive relationships* (Mi, No, Sw). The category refers to constructive relationships between conflict actors, reflected in open dialogue, co-operation and multiple ways of managing relations between the conflict actors.

Polarised relations were more characteristic of Finland, France, West Germany and the Pacific Northwest than to the other cases. According to the analysis, polarised relationships (rela) occurred particularly when there was strong clash between environmental and community values (CLAS), and in situations with strong emphasis on substance-oriented conflict management through, for example, information dissemination (SUBS). Furthermore, the analysis points to the existence of polarised relations in cases with strong resistance to change, which is illustrated by lack of reform combined with low level of responsiveness to pressures in forestry practice (refo*resp). It is interesting to note that each of these explanations refer to slightly different groups of cases, although these groups also overlap to a significant degree.

Constructive relationships (RELA), on the other hand, were descriptive of Minnesota, Norway and Sweden. In all three cases, the characteristics describing the constructive relations were similar. These characteristics included the combinations of either peaceful co-existence of various values or mild conflicts (clas or inte) with either an untraditional and flexible policy setting or conflict management focusing more on relations or processes than substance (trad or subs).

It is interesting to follow the lead of similarities between intensity of conflicts (INTE/inte) and type of relationships between conflict actors (RELA/rela). According to the analysis, poor relationships (rela) were not directly connected to intense conflicts, although the category 'CLAS' formed an important indirect connection between these two categories. Constructive relations (RELA), on the other hand, only occurred in cases with mild conflicts and peaceful co-existence of different values.

3. *SUBS: substance oriented conflict management* (Fi, Fr, WG). This category illustrates unbalanced use of various conflict management approaches, with main focus on substance management (e.g. information dissemination and joint image campaigning by the whole forest sector). Relations management is weak, which is reflected in the institutional and rather regulated nature of process management.

The analysis provides three different types of explanations for cases, which did not place strong emphasis on substance oriented conflict management. The first consists of those having constructive relations between the conflict actors (RELA) (Minnesota, Norway, Sweden). When investigating the construction of this characteristic in more detail (see analysis of RELA), connection is found between 'RELA' and peaceful co-existence of various values (clas), mild conflicts (inte), and an untraditional and flexible policy setting (trad). These characteristics obviously illustrate emphasis on relations management which may reduce emphasis on substance oriented conflict management.

The second group of cases with little focus on substance oriented conflict management included Minnesota and Pacific Northwest. The low emphasis on substance management was explained in the analysis by the experiencing of dramatic changes in policy or resource use (CHAN) in these cases. Again, in order to understand this connection, we have to look at the analysis of 'CHAN'. It shows that a connection is found between 'CHAN' and an untraditional and flexible policy setting (trad), and strong public involvement in public forest management or policy processes (PUBL). Both aspects can already be understood as dimensions of procedural conflict management, which seem to strongly co-exist with substance management.

The third group consists of Norway and the Pacific Northwest. Thus, the group overlaps with the two groups presented above. The group is characterised by an untraditional and flexible policy setting, but yet, a non-reformatory approach to policy-making (trad*refo).

The analysis of cases with strong emphasis on substance oriented conflict management (SUBS) (Finland, France, West Germany) combines this feature to the simultaneous existence of a certain

amount of stability or controlled development in policy and resource use (chan) and poor relations (rela). In addition to lack of relations management, this might suggest difficulties involved in procedural conflict management even in an otherwise favourable policy setting, if poor relations between the different conflict actors exist.

4. *CHAN: change in policy and resource use (Mi, PN)*. This category is a combination of several rather different types of characteristics. It is characterised by reforms in public forest management, dramatic changes in harvest levels, dispersed environmental and forestry policies, and the importance of non-wood and indigenous use of forests. Moreover, it features strong involvement of the judicial system and the scientific community in the conflicts, in contrast to limited involvement of actors representing the product markets (limited market pressure). Furthermore, the category also differentiates the European cases from the American ones.

Because the features that constitute the category 'CHAN' are very heterogeneous, it is natural that the configurations describing this category in the analysis also include great variation. In both American cases (Minnesota, Pacific Northwest), the category 'CHAN' is connected to a variety of categories illustrating openness in policy processes; a non-traditional and flexible policy setting (trad), the involvement of multiple parties (PUBL); not avoiding open values conflicts (avoi), and little focus on substance management (subs). However, openness as such does not describe the type of relations (constructive or polarised) between the different conflict actors. The fact that these characteristics are strongly combined with the category 'resp' suggests that such openness is more related to policy processes than market pressure.

The European cases (chan) fall into three different groups, according to three different categories already described (SUBS, RESP, publ). These three groups are not exclusive, but overlap to some degree. The way in which they overlap suggests that the European cases can be divided into three main groups: Finland itself; Sweden and Norway; and France and West Germany.

All in all, the category (CHAN/chan) indicates that there are substantial differences in conflict elements between Europe and USA. Moreover, it

divides the European cases into three groups: Finland; Scandinavia; and Central Europe. However, this division is made with less precision than the division between Europe and USA. Accordingly, the understanding of the category 'CHAN' largely changes during the process of interpretation, and in the end, strongly supports the idea of the cultural nature of conflicts.

5. *RESP: responsiveness to market pressure (Fi, No, Sw)*. The category reflects rapid increase of environmental consideration in private forest management as a result of pressure from environmentally sensitive export markets, despite an already rather high level of protected forests and long public rights traditions, and despite wood-production oriented forest legislation.

The Nordic countries (Finland, Norway and Sweden) were all classified as being responsive to market pressure in the form of changing forestry practises (RESP). Only two categories were found to describe this feature: the combination of certain amount of stability or controlled development in policy; and resource use within an untraditional and flexible policy setting (chan*trad). This suggests that market pressure is one important background to reformatory policies. However, as the analysis of the category 'REFO' suggests (category 6), it is not a necessary or a sufficient condition. It is interesting to note that the category 'RESP' also clearly excludes cases from the USA (CHAN) and Central Europe (TRAD). This type of geographic division between Scandinavia, Europe, and USA is also apparent in relation to market structures of forest products.

In analysing the lack of strong market pressure (resp), the analysis groups the US cases together, emphasising the aspect of change in policy and resource use (CHAN), and more particularly the same characteristics related to openness as described in relation to category 'CHAN' above (category 4). It is interesting to note that here, the category 'CHAN' is not understood as being related environmental market pressure, although dramatic changes in the use of forests as an environmental resource have had significant effects on wood markets in these cases.

Interestingly, the analysis also groups the Pacific Northwest together with the Central European cases (France and West Germany). A feature common for these cases is the logical

combination of poor relations and non-reformatory policies (rela*refo). Moreover, it suggests a slight connection between France and Minnesota, which are not grouped together anywhere else in this analysis. This connection is based on a situation where bringing values in the open has not lead to very intensive forms of conflict (avoi*inte). Altogether, the analysis indicates a multitude of situations where market pressure for environmental consideration has remained limited.

6. *REFO: reformatory approach to policy (Fi, Mi, Sw)*. Initiation of major policy reforms within a setting of co-operative administrations is the major feature characteristic of this category. Multiple interests participated in the policy processes, without significant party political tension involved.

In relation to the analysis of progressive and reformatory policies (REFO), Norway and Sweden were contradictory cases. This means that although these two cases were coded similarly in all other categories, they differentiated in relation to the category analysed. In such a case, the analysis is conducted by including both cases in both analyses (see discussion in Section 4.1.3).

The reformatory cases (Finland, Minnesota, Sweden, and Norway as a contradictory case) were grouped in two. The result of the analysis is very logical and simply suggests that reformatory policies are related to either responsiveness to market pressure (RESP) or constructive relations (RELA). For further understanding, see the interpretations made of these categories (categories 2. and 5.).

Less reformatory cases (refo) were also divided into two groups. The first group includes France, West Germany and Norway (and Sweden as a contradictory case). In relation to these cases, the analysis indicates that policy reforms have not been very actual in situations where mild conflicts in relation to little change in policy or resource use (inte*chan) have not raised pressure on public forestry of public forest management processes (publ).

The second group consisting of three cases (France, West Germany, Pacific Northwest USA) is more interesting. It suggest that progressive and reformatory policies have not occurred in cases

with a combination of poor relationships and little responsiveness to market pressure (rela*resp). This combination of cases also appeared in the analysis of the category 'resp' (category 5.).

The contradictory situation between Norway and Sweden (they only differed in relation to the category analysed) reflects the fact that Norway and Sweden are truly very similar in most respects. The fact that these two countries have indeed significant differences in relation to activity in policy reforms (REFO/refo) is supported by the fact that, despite the contradictions in the analysis, the results seem logical and easy to interpret. The situation with contradictions also suggest that there are other differences between these two cases, but that the categories used in the analysis are not specific enough so that such differences could be recognised.

7. *TRAD: stable policies in a traditional setting (Fr, WG)*. This category illustrates a situation where in an atmosphere of long professional and forest use traditions, and under multiple forest management regimes, debate focuses on silvicultural issues rather than the protection of old-growth forests. Policies are relatively stable but frequent administrative struggles of competencies exist. The scope of involvement in policies is relatively narrow (e.g. little involvement of other than forestry or environmental interests), and the level of conflict management is relatively low. Moreover, forestry faces significant problems of profitability and market pressures for increased environmental consideration are internal to the countries.

This group contains both Central European cases (France, West Germany). The stable policies in the traditional settings of these two cases offer a wide range of interpretations. This is logical from the point of view that also the category 'TRAD' consisted of many different dimensions. The most important of these dimensions include substance-oriented conflict management (SUBS), limited pressure on public forestry and participatory forest management (publ), non-reformatory approach to policy (refo), and low market pressure (resp). Excluding the category of mild conflicts (inte), all categories listed reflect elements of stability and little change.

When analysing the category representing an untraditional and flexible policy setting (trad),

a total of four different, but partly overlapping, groups were found. An untraditional and flexible policy setting was related to any of the following aspects: responsiveness to market pressure (RESP); a reformatory approach to policy (REFO); focus on public forestry and participation (PUBL); and substance-oriented conflict management (subs). Thus, this result is very similar to the results received from the analysis of 'TRAD' above.

8. *PUBL: public forestry in focus (Fi, Mi, PN)*. Within the cases belonging to this category, the role of public forestry as an important conflict theme results in the involvement of multiple interest groups and the public in official policy processes (e.g. public participation in forest management planning). The complement group consisting of the remaining four cases (France, West Germany, Norway, Sweden) also revealed characteristics of their own: few on-site struggles and little debate on such conflict issues as the social impacts of increased protection, the role of public forestry, or the level of forest utilisation.

The analysis of 'PUBL/publ' provides configurations with a very simple structure. Strong focus on public forestry and participation (PUBL) existed in cases with an untraditional and flexible policy setting where open value conflicts were not avoided (trad*avoi). On the other hand, less focus on public forestry and participation (publ) was found to exist in cases with mild conflicts in relation to little or gradual policy change (chan*inte). Accordingly, the dimension 'PUBL/publ', to some extent, also describes a dimension of stability and traditionalism vs. change and reform (see the importance of the category 'PUBL/publ' in the analyses of categories 'chan', 'refo' and 'trad').

9. *AVOI: avoidance of open value conflict (WG, No, Sw)*. This category illustrates the avoidance of open value conflicts, and the frequent use of formal channels of value communication. However, when interpreting this analysis, it is important to note that this group rarely appeared as a whole in the groupings analysis. Instead, it was formed from a variety of other statements (as complement statements and joint statements).

The avoidance of open value conflicts (AVOI) was characteristic to three cases (West Germany, Norway and Sweden). It was strongly related to little clash between environmental and

community values (clas), combined with either little focus on public forestry and participation (publ) or little or controlled change in policy and resource use (chan).

This view is even more emphasised in the analysis of the complement statement (avoi), which groups the cases in two different groups: those having strong clash between community and ecological values (CLAS); and those having strong focus on public forestry (PUBL).

10. *CLAS: clash of environmental and community values (Fi, Fr, PN)*. The final category included in the analysis illustrates strong struggles between environmental and community values, which has led to difficulties in relations management. Value communication, for example, is mainly directed towards the public instead of directly to the conflict partners.

Strong value clash (CLAS) was apparent in three cases (Finland, France, Pacific Northwest). This is an interesting group because it is the only one involving one case from each of the major geographic areas of this study (USA, Central Europe, Nordic countries). As already indicated in the analysis of the category 'avoi', these two categories are strongly related. However, willingness to express values openly (avoi) is not sufficient to explain strong value clash if not combined with poor relationships (rela).

Finally, as a logical consequence, the complement statement describing the lack of strong value conflicts (clas) divides the cases in two main groups characterised by either constructive relationships (RELA) or avoidance of open value conflict (AVOI).

11. *COMM: communicative relations (Mi)*. Rather than forest management practises or protection, the major conflict theme relevant to this category has been the overall level of forest utilisation. This debate has involved multiple interests and the use of multiple channels of value communication. Because the category differentiates one case (Minnesota) from all others, for technical reasons, it offers little basis for interpretation. Moreover, the category is closely enough related to another (RELA) in order to be understood as part of it. Subsequently, it was excluded from the analysis

12. *MILD: mild dialectic conflicts (WG, Mi, No)*. Few on-site protests or campaigning under condi-

tions of stable policies with low level of involvement in official processes describe cases within this category. The category 'MILD' was excluded from the analysis because it can be understood as part of the category 'inte'. Moreover, it is evident from the overall figure of relations between the categorisations (Fig. 14 on p. 57) that multiple backgrounds can be found for mild conflict, all of which seem to come forth rather well in the analysis, without the use of this distinct category.

13. *MARK: market communication (No, Sw)*. Cases within this category share strong focus on substance oriented conflict management as a response to market pressure. In addition to aiming to change substantial images through active communication of market values (e.g. certification initiatives), also the substance itself was strongly revised (e.g. forest management). Norway and Sweden fall in a similar group in relation to several categories. Therefore, it may be expected that an additional category combining only these two cases may not provide much more insight for interpretation. Accordingly, it was excluded from the analysis.

14. *OLDG: external pressure on old-growth forests (Fi, No, PN, Sw)*. Increase of forest protection, owing to the existence of a significant amount of unprotected old-growth forest, high external environmental pressure and strong media interest are characteristics common to cases within this category. It is often claimed that old-growth forests (OLDG) are an important background to intensive conflicts. Why exclude this category and not any other? Already by briefly looking at the figure illustrating the connections between the different categories (Fig. 14), it is evident that the existence of old-growth forests is not a sufficient explanation for intense conflicts. Moreover, the category 'OLDG' can be viewed as a combination of two categories (RESP*INTE). It could be assumed that if this configuration appears in the final analysis, this choice has to be reconsidered. This was not the case. The four cases having old-growth forests (OLDG) all appeared along the same line along the scale of mild and intense conflicts. Nowhere in the analysis did these four cases appear as a joint group. This suggests that natural conditions may not be as decisive as a factor explaining conflicts intensity as commonly assumed.

4.3.3 Answering Questions Raised during the Analysis

In the analysis of the various elements of the analytic frame (Section 4.2), questions for further analysis were raised. Does this final analysis offer any answers to these questions?

Value aspects and conflict intensity. Finland and Pacific Northwest USA appear very similar not only in relation to their intense conflicts, but also in relation to many value aspects involved. How decisive are value aspects for the occurrence of intense conflicts?

Intense conflicts appear to be very closely related to value aspects of the conflicts, e.g. the existence of a strong clash of environmental and community values, and polarised relationships. Either one of these aspects is present in all intense conflicts. On the other hand, intense conflicts did not appear in those cases with only limited open clash of different values.

Policy aspects and conflict intensity. The figure describing the overall groupings of the cases (Fig. 13 on p. 55) suggests that policy aspects occur rather randomly in relation to the other aspects of the conflicts. Is this view supported by further analysis?

Policy aspects were closely related to the intensity of conflicts. For example, intense conflicts did not appear in situations with a stable and traditional policy setting, or when there was little focus on public forestry. On the contrary, a reformatory approach to forest policy was closely related to intense conflicts in circumstances where it was supported by constructive relations or responsiveness to market pressure.

Market aspects and conflict intensity. All the Nordic countries faced significant market pressure on increased environmental protection. How decisive was this in relation to the intensity of the conflicts?

No direct connection was found between the intensity of the conflicts and the level of market pressure. The intensity of conflicts within those countries that faced most market pressure varied from the mildest ones to the most intense ones.

Resource aspects and conflict intensity. A quick look at overview of groupings based on the analysis of the elements of the analytic frame (Fig. 11 on p. 52) suggests that many similarities may be found between the type of conflict and the struc-

ture and use of forest resources. How decisive a factor is the structure and use traditions of forest resources for the type of conflicts?

The structure of forest resources (e.g. existence of old-growth forests) is a necessary but not sufficient background for explaining intense conflicts; although all cases with intense conflicts involved a struggle over the protection of old-growth forests, not all cases facing pressure on the protection of old-growth forests, faced intense conflicts.

Mild conflicts. What do the mild conflicts in West Germany and Minnesota have in common? Can the mild nature of these conflicts be understood in the light of social, economic, political or resources aspects, or are they a result of conflict management approaches?

Regarding the mild, discussion oriented conflicts of Minnesota and West Germany; it is interesting to note that Minnesota and West Germany do not appear in similar groups anywhere else in the analysis. This suggests that mild conflicts may occur in rather different types of settings; stable policies in separatist relations, or progressive policies under constructive relations.

Relations oriented conflict management. Conflict management approaches seem to be often related to value aspects of the conflicts. To what extent do values and the relationships between the different actors affect the choice of conflict management approaches? Are conflict management strategies chosen on the basis of present relations between different groups, or are they designed to improve such relations? For example, do inflected relations result in choosing non-relations oriented conflict management approaches and with what implications? Is effective conflict management possible in situations with infected value conflicts?

The analysis suggests that relations management is least found in those cases where most polarised relations existed, and thus, where such conflict management would be needed the most. In fact, instead of rational choice, the same societal structures and processes that promote the appearance of a certain type of conflict, often affect the conflict management approaches used. This type of setting may easily result in a vicious circle, where poor relations produce intense conflicts, aggravating the conflict partner even more, to the extent that there is little willingness to

consciously manage the relations between different conflict actors.

Substance oriented conflict management. To what extent do the groupings related to substance management coincide with conflict themes or forest resources?

All cases with strong substance management represent different geographical regions and very different types of forest resources. Like many other aspects, substance oriented conflict management is very often related to difficulties in managing group relations.

Process oriented conflict management. To what extent do the groupings related to process oriented conflict management coincide with policy or market processes?

Process oriented conflict management was least found in stable and traditional policy settings. On the other hand, institutional process management was mostly used in situations with dramatic policy changes.

Choice of conflict management strategy. There are significant differences in the level of conflict management in different cases. How are conflict management strategies reflected in the type and intensity of conflicts? Are mild conflicts consequences of active conflict management or do they appear despite the lack of conflict management?

Neither assumption seems correct. Instead, it is an issue related to different types of management strategies. Cases with stronger emphasis on relations management had milder conflicts than cases with stronger relation on substance oriented conflict management.

Europe vs. USA. The cases can be easily divided into three geographical regions: Central Europe, Scandinavia and USA. How are geographical differences reflected in other aspects of conflicts?

The analysis points out significant differences between Europe and North America, although there are clearly identifiable sub groups within these regions, too. The geographical dimension of conflicts supports the general assumption behind the research that conflicts are culture related.

Between the various geographical regions, significant differences are found in relation to all aspects of the conflicts: values, policy traditions, markets, and forest resources. However, many of the aspects important in relation to conflicts also overcome geographic borders. Thus, although

the analysis strongly suggests that geography does make a difference, geography is not decisive for many aspects of the conflicts.

Scandinavia. Why are conflicts in Finland so much more intensive than in Norway or Sweden, although they all have rather similar backgrounds in many social, economic, political and resources aspects?

The main differences between Finland and the other Nordic countries were related to value aspects of the conflicts and the relations between different conflict actors. Accordingly, the analysis suggests that there are significant cultural differences related to environmental conflicts in forestry between Finland and the other Nordic countries of this study.

5 Discussion

5.1 Overview of the Study and Findings

This research was motivated by the notion that despite the internationalisation of the forestry debate and forest policy, very little comparative research on environmental forestry conflicts is conducted from international and cultural perspectives (Section 1.5.1).

The purpose of this study was to: (1) describe the culture of environmental conflicts in forestry in the seven cases selected for this study; (2) to identify and analyse the major societal aspects that impact the conflict cultures of these cases; and on this basis, (3) to discuss the implications of understanding the origin and management of conflicts as cultural phenomena.

All individual conflicts that appeared during the whole period of investigation (1984–1995) in each of these seven countries or regions investigated (Finland, France, Norway, Sweden, Minnesota USA, Pacific Northwest USA, and West Germany) formed one single case. Thus, a case represented the ‘conflict culture’ of the society examined. The research was based on the notion that each society has its own cultural ways of producing and managing environmental conflicts in forestry, depending on the social, economic, political and physical environment of the society.

The analytic frame for data analysis consisted of two sets of elements: descriptive aspects of the conflicts (conflict types and approaches to conflict management); and societal aspects of the conflicts (e.g. social, policy, economic and resource aspects of the conflicts). The descriptive aspects were derived from conflict research conducted by a wide variety of scientists, and the societal aspects were derived from a forestry-related application of the holistic view on natural resources by Koch and Kennedy (1991). Each element was analysed from three perspectives (substance, procedure and relations), as explicated by Walker and Daniels (1997) in their work on the different dimensions of conflicts and conflict management.

The research used focused interviews as the primary source of data. Approximately 30 persons were interviewed for each case (211 interviews in total). The interviewees represented research, the media, environmental movement, environmental administration, forestry administration, forest owners, forest industries, and other interests, according to their relevance for each case. On the basis of the interviews, images (case descriptions) of the seven cases were constructed. These descriptions formed the data for the comparative analysis.

This descriptive data was categorised into a total of 86 categories. Then, two subsequent sets of non-causal analyses of Qualitative Comparative Analysis (QCA) were conducted. The empirical typology approach (originally explicated by Ragin (1987)) that was used to group the cases and condense the data comprised a series of analyses and subsequent interpretation, through which the data was condensed into only ten different categories. The main purpose of the second set of analyses with QCA was to examine how the new categories were related to each other. For this purpose, a hermeneutic approach for analysing the data with QCA was developed (Rantala and Hellström 2001).

The two approaches to QCA were not subsequent but simultaneous and intertwined. The process resembles a hermeneutic circle where understanding moves from entities (cases) to parts (characteristics) and back so that a higher level of understanding is reached at each circle of the spiral. As typical for this type of research, the process of interpretation and its product (results) are often difficult to separate from each other. Below, only a couple of the most interesting findings are listed:

- Intense conflicts appeared to be very closely related to value aspects of the conflicts, e.g. polarised relationships and the existence of a strong clash of environmental and community values.
- Mild conflicts, on the other hand, occurred in rather different types of settings; stable policies

- under the condition of separatist relations, or progressive policies under the condition of constructive relations.
- A reformatory approach to forest policy was closely related to conflicts of moderate intensity, in circumstances where constructive relations between the conflict partners or their responsive attitude and actions to market pressure supported policy development.
 - A ‘conflict-sensitive’ structure of forest resources (e.g. existence of unprotected old-growth forests) was found to be a necessary, but not sufficient background for the most intense conflicts.
 - Conflict management focusing on improving the relations of the conflict actors was least found in those cases with the most polarised relations, thus, where such conflict management would have been needed the most. Cases with strong emphasis on relations management had milder conflicts than cases with emphasis on substance oriented conflict management.

5.2 Resulting Ideas: Understanding Conflicts as Cultural Phenomena

5.2.1 Perceptions of Conflict

Conflicts can be viewed as cultural phenomena from at least three perspectives: perceptions of conflicts (see below); societal aspects of conflicts (Section 5.2.2); and conflict management strategies (Section 5.2.3).

The interview material used in this study, and analysis of it offer many interesting points of view for discussing how conflicts are perceived, or how they should be perceived.

Environmental conflicts in forestry in many Western countries often appear to be similar at first sight. Yet, there are significant variations in the themes discussed, the protagonists involved, the geographic scales and the type of conflicts. Interestingly, differences in the type of conflicts are also, to some extent, reflected in the language used by the interviewees in this study. In relation to forestry conflicts, a term utilised in West Germany is ‘forest discussion’. The term ‘forestry debate’ is often met in Sweden, and ‘forest wars’ in Finland. In the USA, the terms ‘forestry debates’, ‘disputes’ and ‘wars’ are all used,

depending upon the region (Hellström 1998c). This is not a matter of linguistic expression only. The findings of this research clearly illustrate how each society has its own culturally varnished way to produce certain types of conflicts within certain types of social, economic, and ecological conditions.

The media is an important actor affecting public perceptions of conflict. In the cases examined, the media was strongly involved in the conflicts in all cases where on-site struggles occurred, regardless of the importance of forestry for the national or regional economy, and regardless of the level of environmental awareness of the population. The more on-site struggles, the stronger media involvement was detected (see Hellström 1998b)

Because the media especially tended to publicise intense conflicts, a misconception met among some of the interviewees is the assumed decisive connection between the intensity of conflict and the severity of the ecological problems involved. It is only natural that the greater the ecological problems are thought to be, the more vigorously the environmental movement tends to raise pressure for resolving them. However, the means of action chosen to promote the resolution of the environmental problems involved also have a strong cultural dimension. For example, the analysis suggests that in relation to the forms of struggles, Finland and the Pacific Northwest USA are more action oriented, Sweden more campaign oriented and Minnesota more dialogue oriented than the other cases. Therefore, the form of conflict does not directly indicate the severity of the ecological problems involved, or depth of the controversy.

Not only are conflicts cultural phenomena, but also our perceptions of conflict intensity are cultural: the intensity of conflict is not a reflection of specific types of actions of the conflict actors (e.g. litigation, violence, campaigns) but of how severe social problems these actions are perceived as. What looks like a severe conflict from the outside, may from the inside look like an everyday discourse, and vice versa. For example, extensive on-site protests may seem like severe social problems from the point of view of a country, which is used to dealing with conflicts through dialogue or campaigning (e.g. Norway,

Sweden). On the other hand, conflicts involving frequent litigation may be viewed as very severe from the point of view of a case with frequent on-site struggles but little litigation (e.g. Finland).

Internationalisation opens up communication channels between very different types of conflict cultures. The difficulties in understanding the conflict culture of another nation may reduce our ability to understand the severity of ecological or other problems behind the conflicts. Subsequently, policy or business decisions may tend to be based more on the external perception of conflict intensity (actions of specific conflict actors) than on the internal perception of conflict intensity (whether regarded as a social problem or not).

In international communication, there is a need to differentiate between conflict facts and perceptions (images) of conflicts, and to increase understanding cultural differences when making international comparisons of any kind. Accordingly, an interesting question for further conflict analysis is the relationship between conflict intensity when measured by the actions of conflict partners and when measured as perceived social problems.

Conflict cultures may also be reviewed in the light of social sustainability. The total lack of conflicts may be a sign of low social sustainability of forestry, if there are such underlying repressive social systems that do not allow for open conflicts to occur. Conflicts may be a sign of low social sustainability also in the case where conflicts produce severe discontinuities in social development; advances and retarding after one another. On the other hand, conflicts are a sign of social sustainability when the conflicts are brought into the open for resolution. Even conflicts which look intense from the outside may be socially sustainable if they constitute constant, commonly accepted reforms. This implies that conflicts are understood as involving at least two opposite parties, which was not the case in many of the interviews conducted. Instead, conflicts were often thought to originate primarily from the actions and values of the conflict actors on the opposite side.

5.2.2 *The Societal Aspects of Conflict*

Owing to problems in understanding conflicts as cultural phenomena (see previous section), several misconceptions related to the societal backgrounds of intense conflicts seemed to exist. Among the forest sector, rather typical explanations of intense conflicts included an 'unfavourable' resource structure (existence of old-growth forests), an 'unfavourable' market structure (exports to environmentally conscious markets), or an 'unfavourable' forest ownership pattern (dominance of public ownership). However, the analysis clearly shows how the intensity of conflicts is only partially related to these aspects.

The findings suggest that the value structure and type of relationship between the various conflict actors is perhaps even more crucial as background for the intensity of conflict than policy, market and resource aspects, although they are all interrelated, to some extent. The importance placed on values and relationships as a background to the intensity of conflict implies that the conflicts are, indeed, strongly bound to culture.

Conflicts, although occasionally intense, are not automatically something to be avoided. The analysis clearly indicates that progressive policy reform is most relevant in situations where at least some level of conflict has existed, or in situations where the relationships between conflict actors are very constructive. The findings emphasise the need to control conflicts from extreme aggravation or escalation (not total resolution), and the need to not only recognise the variety of values involved, but also to recognise and respect the roles of different actors in policy development.

Many interesting societal aspects of conflicts, such as those mentioned above, can be viewed from a more structured point view, too. During the comparative hermeneutic analysis of conflict cultures (Section 4.3), the data and main findings were presented in graphs (Fig. 13 and Fig. 14) that illustrated to what extent the major aspects of conflicts were similar or different between cases, and how the different aspects were related to each other. A question was raised whether, on the basis of the interpretations made, it would be possible to define dimensions for the triangle shaped graphs, and thus, build a model of the conflict cultures involved.

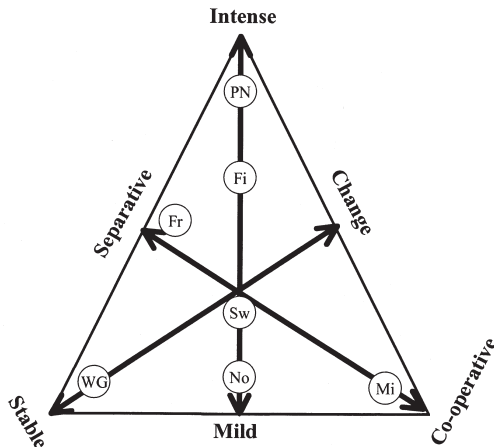


Fig. 15. Model of conflict cultures built upon the cases (Finland, France, Minnesota USA, Norway, Pacific Northwest USA, Sweden and West Germany).

Indeed, three major dimensions can be found for the model of conflict cultures (Fig. 15). The first dimension describes the intensity of struggles; the 'mild-intensive' dimension. The second dimension describes the relationships of conflict actors along a 'separatist-co-operative' scale. The third dimension reflects a dimension of 'stability-change' in forest policy and resource use.

The vertical dimension of the conflicts contrasts Pacific Northwest with West Germany, Norway and Minnesota. The case with most intensive conflicts (PN) is located at the very top, and the three cases with the mildest conflicts (WG, Mi, No) are all located along the bottom. These three cases also formed a category of their own (MILD), indicating the mild nature of conflicts, but this category was excluded from the analysis (for description of the contents of categories, see Section 4.3.2).

The second dimension (contrasting Mi with WG, Fr, and PN) describes the relationships of conflict actors along a 'separatist-co-operative' scale. During the comparative analysis, most categories relating to Minnesota describe co-operation between the conflict actors; constructive relations, activity in policy reform (REFO), and participatory policy processes (PUBL). The fourth category related to Minnesota (CHAN) reflects a certain type of openness in policy, in

addition to changes in policy and resource use. It is also important to note that during the analysis of conflict elements, this categorisation (COMM) was, as such, excluded from the final analysis.

On the other side of the triangle, West Germany, France and the Pacific Northwest share some form of serious problems in the relations between conflict actors. West Germany and France share significant administrative struggles (TRAD) and strong dependency on substance oriented conflict management (SUBS), whereas France and the Pacific Northwest share a strong and open clash of environmental and community values (CLAS). This indicates that the contrast to co-operative relations may be interpreted as either polarised relations (PN, Fr) or distant relations (Fr, WG). This interpretation is also supported by the fact that an additional feature typical of the West Germany case is the avoidance of open value conflicts (AVOI), which can be understood to reflect a degree of separation.

The third dimension (contrasting WG with PN and Mi) reflects a dimension of 'stability-change'. In the left corner, West Germany is characterised by the coinciding of strong reliance on substance oriented conflict management (SUBS), stable policies (TRAD) and avoidance of open value conflict (AVOI). A factor in common for all these is pursuing stability in all aspects of conflicts: substance, relations and processes. In contrast, change is an important element describing both Minnesota and the Pacific Northwest. It is reflected both in the use of forest resources (CHAN), judicial decisions, and in public policy processes (PUBL).

An important feature in this triangle formed model is that placing a case along two of the scales also defines its location in relation to the third scale. Including the following, the model enables many readings:

- Dramatic change in forest policy or resource uses in a situation of polarised relations was related to intense conflicts (Pacific Northwest USA).
- The mild nature of conflicts together with isolated relations of the conflict actors were related to non-reformatory and stable policies (West Germany).
- Mild conflicts consisted of three types of cases: those related to stable conditions (West Germany), those related to co-operative relations between

conflict actors (Minnesota), and those featuring both (Norway).

- Reformatory policies occurred in situations where the cases situated simultaneously at the co-operative end of the relationship scale and the mild end of the conflict intensity scale (Minnesota), or where the cases were located near to the centre of each dimension (Finland and Sweden).

The model of conflict culture was presented as a three-dimensional form in such a way that the position of a case in relation to two of the dimensions largely also determined the position of the case in relation to the third dimension. For example, the model suggests that intense conflicts, co-operative relations, and stagnant forest policy do not usually exist simultaneously within the same conflict culture (one case cannot locate in all corners of the triangle at the same time). An interesting question for further studies is to see whether this setting is an outcome of the fact that the cases selected for this study did not represent such cases, or is this phenomenon of a more general nature?

This research focuses on conflicts during the period of twelve years as one case. However, it is important to recognise that if conflicts are regarded as cultural phenomena, they should also be regarded as dynamic phenomena. Cultural characteristics of any society do not exist indefinitely, but they do change and, to some extent, they can be consciously changed. For this purpose, follow-up studies of a similar type to this one may increase our understanding of the dynamics of cultural change in relation to conflicts (see Section 5.3.3). It would also be enlightening to investigate the dynamics of conflict cultures of the past period in shorter time periods.

5.2.3 Conflict Management Strategies

Since each society has their own ‘cultural’ ways of producing environmental conflicts in forestry, and their own attitudes toward them, also conflict management necessarily differs from country to country. Keeping this in mind, a two-dimensional model of conflict management strategies (Fig. 16) is constructed. The dimensions include: institu-

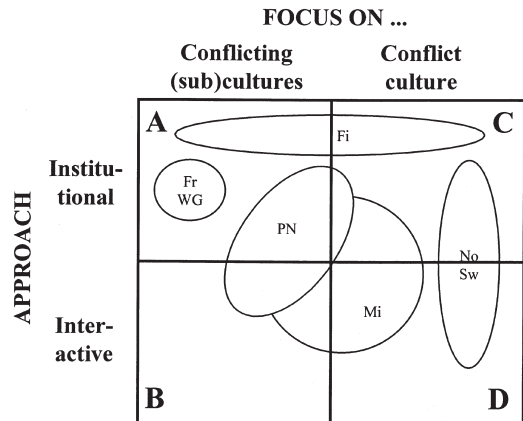


Fig. 16. Model of conflict management strategies built upon the cases (Finland, France, Minnesota USA, Norway, Pacific Northwest USA, Sweden and West Germany).

tional vs. interactive conflict management, and the management of conflicting subcultures vs. the management of conflict culture.

The management of conflicting subcultures involves the management of contradictions resulting from the encountering of two or more subcultures. Most often, these subcultures include actors from the environmental and economic spheres. Many such conflicts focus on specific themes or are tied to specific locations.

Values, policies, markets and resources all have strong cultural dimensions. Changes in any of these aspects result in changes in conflict culture. The management of conflict culture refers to attempts to influence the societal aspects that result in the emergence of specific types of conflicts in certain types of societies.

Whereas the management of conflicting subcultures resembles an ex-post approach, the management of conflict culture represents an ex-ante approach. Both conflicting subcultures and conflict culture can be managed by using an institutional or interactive approach. Below, the four different conflict management strategies are explained, and illustrated with examples from the cases.

The *institutional management of conflicting (sub)cultures* (A in Fig. 16) may involve top-down, authoritarian enforcement of conflict resolution through authoritative institutions, such

as the police and the courts. This type of conflict management approach is typically substance-oriented, with emphasis on proofs and legitimisation. Although generally considered as a non-constructive approach to conflict management, authoritarian conflict management may, in some situations, be the only way to avoid human injury. A more constructive form of institutional management of conflicting subcultures is the resolution of conflicts in official committees or working groups.

In the model of conflict culture, an institutional approach to the management of conflicting subcultures is characterised by the categories describing resistance to change (TRAD, categories explained in Section 4.3.2), strong reliance on substance oriented conflict management (SUBS), the strong involvement of the judicial system in conflicts (CHAN), and the existence of physical on-site protests (INTE). Cases that best illustrate these features include France, West Germany, Finland and Pacific Northwest USA. (For a more detailed description of categories, see Section 4.3.2.)

The *interactive management of conflicting (sub)cultures* (B in Fig. 16) is usually a voluntary-based bottom-up approach to the resolution of individual conflicts. This usually aims at conflict settlement by using a neutral mediator or arbitrator. Under the concept of 'alternative conflict management', these conflict management techniques have been widely developed in the USA where they have even become an important field of science. This interactive approach may be very successful in many local conflicts, but the resolution of one conflict does not necessarily prevent other similar conflicts from occurring elsewhere.

The aim of *institutional management of conflict culture* (C in Fig. 16) is not to react to individual, existing conflicts but to influence specific societal structures or processes underlying them. It is typically based on the notion that conflicts occur as symptoms of specific biases or imbalances in social structures or the operation of the markets, and by responding to these biases or imbalances, the emergence of other similar conflicts can be prevented or decreased. Typical examples of this type of conflict management include public participation in forest management planning and forest certification. The policy review process in

Minnesota was also very much an institutional approach to the management of conflict culture.

In the model of conflict culture, an institutional approach to the management of conflict culture is characterised by the categories describing responsiveness to market pressure (RESP and MARK), focus on public forestry and participation (PUBL), and a reformatory approach to forest policy (REFO). Accordingly, Finland, Norway, Sweden, Minnesota USA, and to a minor extent also Pacific Northwest USA are pointed out in this respect.

Instead of managing individual conflicts, issue or site specific conflicts, or developing institutional processes of conflict management and prevention, the *interactive management of conflict culture* (D in Fig. 16) is based on comprehensive understanding of the potentially positive role of conflicts in social development, and on acting upon it through voluntary and joint efforts to increase the openness of forestry dialogue and improve the relations between various interest groups related to forestry.

In the model of conflict culture, an interactive approach to the management of conflict cultures is characterised by the categories describing constructive relations (RELA) and communicative relations (COMM). These characteristics were found to strongly exist in Minnesota, Norway and Sweden.

The seven cases of this research all place emphasis on different types of conflict management strategies. As the model (Fig. 16) suggests, the four approaches are not exclusive but supportive of one another. Although the model does not imply that any one strategy of conflict management should in all circumstances be preferred to another, a few general notions can still be made.

For example, the most intense conflicts have occurred in cases (Finland and Pacific Northwest) placing significant emphasis on the institutional management of individual site or issue specific conflicts, without significant efforts to interactively develop conflict culture. The cases with strongest value clash (Finland, France and Pacific Northwest) or separative relations between actors (West Germany and France) are also the ones placing most emphasis on the institutional management of individual conflicts. It is also interest-

ing to note that reformatory policy development is only found in those cases (Finland, Minnesota and Sweden) that focus on the management of conflict cultures (right side of Fig. 16). These interpretations all emphasise the need for conscious management of conflict culture.

In everyday life, culture is typically regarded as something old and something to be preserved. This idea of cultural preservation is also present in many forest policy papers of today (e.g. MCPFE 1994). In reality, culture is a dynamic, constantly changing phenomenon. To some extent, we can impact the speed and direction of cultural change. Different means to impact culture have mostly been examined in relation to organisation culture (Hellström 1997b). Even the forest sector may have its internal agents promoting cultural change (Halme 1997).

The data and ideas presented in this report may be used in multiple ways to identify trends and pressure related to changing conflict cultures. Policymakers and conflict actors are invited to make their own conclusions about the needs and possibility for change. This is important because conflict cultures do not change because of external advice, but because of internal understanding.

Developing such understanding is difficult since methods of managing conflict cultures are not well developed or even recognised. Further research could offer important insight and advice for policymakers, if it were able to investigate and develop potential new approaches and methods to the management of conflict cultures, or increase awareness of such.

Nevertheless, it is important to bear in mind that culture only lives and develops through communication. Therefore, the management of conflict culture should be viewed as integral to all activities related to forestry. It is a common task for each of us in our own field; in public relations, policymaking, forest management planning, extension, monitoring, research, wood procurement, marketing, or any other field.

5.3 Evaluation of the Research

5.3.1 From Data to Images

Collecting the Data

Evidence (data) for the research mainly consisted of interview data collected through focused interviews. Three aspects in particular can be considered critical for the validity of focused interviews: concept validity, content validity, and construct validity (Hirsijärvi and Hurme 1991; Hellström and Hyttinen 1996). In the following, the data is discussed from these aspects.

Concept validity implies good knowledge of previous research and the concepts related to the research problem. Hence, it is related to problem definition, construction of the interview protocol, and selection of the analytic frame. Thus, it is difficult to improve concept validity after the material has been collected. Before material collection, a desk study (Hellström 1996a) on recent developments in the case study countries was conducted, resulting in a tentative analytic frame. This also formed a basis for the construction of the interview protocol.

The comparison of cases on the basis of the analytic frame formed an important test of concept validity. An analytic frame that is applicable to several countries simultaneously has to have a rather general format and focus only on the main societal structures and processes, and yet allow for variation among individual cases. Adding too many details to the frame may result in a situation where many of the details that are relevant to one country may not be relevant to another, so that little common basis for comparisons exist. On the other hand, finding a common basis for comparisons may be equally difficult if the frame is too general.

The generality of the analytic frame made it well applicable to all cases, although it did not offer much practical guidance for material collection. Therefore, an interview protocol was developed that was extensive in its detailed suggestions of possible issues for discussion in relation to each of the major themes of the analytic frame. This improved the applicability of the analytic frame in conducting the interviews, despite the fact that slightly different emphasis on themes,

and particularly on individual issues was inevitable. This setting suggests that a reasonable balance between the level of generality and details of the analytic frame and interview protocol was found.

Content validity is related to how well the information received fulfils the core of the phenomenon to be investigated. The total number of interviews was 211. The interviews cannot be considered as a representative sample by using the criteria of sampling theory. Instead, the interviews aim at giving a representative picture of the phenomenon under study. The number of interviews conducted can be considered sufficient for the purpose of this study, because after conducting about 23–25 interviews in each case, very little such additional information was available from additional interviews that would have impacted the general conclusions made. This also suggests that these overall conclusions are not that dependent on the choice of any specific individuals as interviewees.

Being suggested by local experts who had familiarised themselves with the research project, the interviewees chosen for the research can be expected to give a rather balanced representation of different views on the conflicts of each case. Still, lists of suggested interviewees could not be followed in every detail: suggestions of new informants were received along the way, and all those who were suggested were not available for an interview.

Only one interviewer was used to collect the material in each case. Altogether, four different persons conducted the interviews. Some difference between the qualities of various interviews within a case may have been caused by the fact that the skills of the interviewer developed as the number of interviews increased. Although problems of inconsistency may, to some extent, occur between the different cases, the consistency between cases was increased by strong reliance on the analytic frame. A few joint interviews with subsequent discussions on the application of the interview method and analytic frame were also conducted in order to increase consistency between cases.

The analytic frame was reconstructed between data collection and data analysis. The analytic frame used in data collection focused more on

values than on other social aspects of the conflicts. Although some of the other social aspects of the conflicts are indirectly involved through other categorisations, there is some potential gap in data in this respect. Some overlapping, on the other hand, may exist between the categorisation of economic and resource aspects of the conflicts.

Construct validity refers to the ability to measure what was supposed to be measured. The interviewees were asked both fact-finding and opinion-based questions. It is possible that occasionally opinions were expressed when answering fact-finding questions, or vice versa. This is not a problem, since the focus of this study lies in rhetoric or discourse about conflicts, which may include conflict facts as well as opinions on conflict.

Each single focused interview is a unique situation that cannot be repeated, as the interviewee's perceptions of the conflicts change in time. In relation to the interviewees descriptions of forestry conflicts it was particularly difficult to assess the intensity of the various struggles over a particular time span, and the appropriate emphasis that should be given to each. As most interviewees were strongly active in present forest and environmental policy, there is also a risk that, the more recent developments were emphasised at the expense of developments, which took place in the 1980s.

Despite common themes defined in the interview protocol, each interview was different. For example, an issue considered relevant by one person may not have been considered relevant by another. In some cases, an interviewee may not have taken up an issue which has later come up as relevant in other interviews, or an interviewee may not have been willing to give sufficient answers to questions that they have considered as irrelevant or sensitive. The collection of supportive written material was essential in relation to both concerns presented above.

Forming the Images

If the same conclusions can be reached at by analysing the same data with the use of a different method, the analysis is confirmable (Tynjälä

1991, p. 390–392). The confirmability of the internal analysis is based on the fact that the interviews were recorded on tape. Theoretically, anyone could re-transcribe and re-analyse these tapes and use it as a basis for other research. However, already during transcription – and in subsequent analyses – interpretation of the data in relation to the analytic frame was made. Accordingly, the confirmability of the research is largely dependent on how the analytic frame is understood by different researchers.

For interpretation, the data was organised and presented according to a structure compatible with the analytic frame. For this process, only text processing software was used. However, this type of analysis would have benefited from the use of more systematic ways of analysing textual records, particularly qualitative data analysis software. In fact, if this research were conducted again, it would be recommendable to use code and retrieve analysis, such as NUD*IST or ATLAS.ti, in forming the case descriptions and initial categories to be used in the analysis with QCA. The use of such methods would have made the research process more visible not only to the researcher herself but also to readers. Moreover, it would have increased the confirmability of the interpretations made.

Owing to limited time and resources, country reports were produced for five cases out of seven (Hellström and Welp 1996; Hellström and Ryttilä 1998; Hellström and Vehmasto 2001). A peer review process increases the value of the images produced. The preparation of a publication always helps refine the ideas and images to some degree. Therefore, it is possible that the images for the remaining two cases do not quite equal the others. In Norway, the problem is related to too little information, whereas in Finland, which is the researcher's home country, coherence may be reduced by overwhelming information.

5.3.2 *Qualitative Comparative Analysis*

Evaluation of the Method

In designing comparative research of social phenomena, a danger exists that if the research setting is extensively modified to fit a chosen

research strategy or method, the questions that are answered may no longer be the initial questions for which answers were sought. Thus, it may in some cases be wiser to adapt the approaches and methods to fit the phenomenon to be investigated. In this research, this was done by developing a new hermeneutic approach to the method of QCA. Despite modifications, the method should still be trustworthy, credible, confirmable and dependable (see Yin 1994).

If the method can handle difficult circumstances or exceptions, the method is dependable. Such variation in circumstances may be due to internal or external factors. Particularly when introducing a new application to a method, the issue of dependability has to be carefully evaluated (Tynjälä 1991, p. 390–392).

Having a formal structure as data software, the QCA method is from an external point of view very dependable. The external dependability of QCA is increased by its ability to handle 'exceptional' cases, treating them as wholes. This means that in each phase of the analysis, the researcher is able to refer to actual cases, instead of statistical terms such as means or covariance. As the method aims at discovering variation, it is also able to handle great deviation in the data, which is not hidden behind statistical reconstructions. The new hermeneutic approach to QCA increases the external dependability of the method even further in turning some of the technical problems related to causal analysis (contradictions and counterfactuals) into strengths (Section 4.1.3, see also Rantala and Hellström 2001). Consequently, the dependability of the QCA method is, less related to external than internal factors; e.g. the nature of the data.

As the hermeneutic approach to QCA was developed during this research, the understanding of how the data affects the internal dependability of the method was only understood through a long series of trial and error. In the beginning, some experimental analyses were conducted with different selections of categories, resulting in great problems of interpretation. This even raised suspicion about the potential of the method in relation to the data. However, as more effort was placed into the systematic condensing and organising of data into groupings by using the empirical typology approach, also the data used in the herme-

neutic analysis gradually began to minimise in a more and more logical way, resulting in increasingly improved interpretations. It seemed that in the beginning, the data was not yet sufficiently well organised for fruitful analysis.

This suggests that the dependability of the method is largely dependent on how well the data is pre-organised, either empirically (as in the application of the empirical typology approach in this research) or theoretically (as in Rantala and Hellström 2001). Data is well pre-organised, if the categories are informative and distinct in terms of illustrating different issues, but if they are still related in terms of representing the same general theme, which they illustrate from different perspectives. Too little overlapping in content means that the categories are too distinct to be about the same general theme, and too much overlapping in content means that the categories can hardly be distinguished from each other (Rantala and Hellström 2001). From a technical point, too little overlapping means that the data will not easily minimise, and too much overlapping means that the data is minimised too much in order to build a basis for fruitful interpretation.

In this respect, the ability of the method to handle difficult circumstances is limited. The method also places other limitations on data. The amount of categories used in one analysis is limited, depending on the nature of the data, the number of cases compared, and the approach used in the analysis.

The confirmability of the causal application of the method has been tested on many occasions. In fact, most early applications of the method included re-analysis of data collected in other research, and analysed with other methods (for lists of re-analyses see Appendix 4). The confirmability of the new hermeneutic approach has not been tested. In this research, the use of distinct categories as the basis for analysis provides a fruitful basis for ‘testing’ the results and ideas received with the use of other comparative methodology. For example, correspondence analysis could offer an interesting possibility for such testing.

As noted in the previous section (Section 5.3.1), the confirmability of QCA analysis is not so much dependent on the method itself, but on the interpretations and choices made during categorisation.

The categorisations are affected by theoretical considerations, the ability of the data to describe the preferred dimensions, the technical requirements of method, and the input of the categorisations to the overall interpretation of the data.

The research is credible if the reconstruction of reality that it presents can be thought to exist (Tynjälä 1991, p. 390–392). The credibility of the method is highlighted by the fact that during all phases of analysis, it handles cases as wholes, and the fact that the results are interpreted in relation to each separately. Even during final interpretation, the researcher never distances from the actual cases, and it is easy to notice if the resulting overall interpretations of the comparative analysis are not compatible with the understanding of each single case. Largely, the cases of this research can be understood in the light of the models built. The credibility of the resulting ideas of this research can also be viewed in relation to other theories and experiences described in conflict literature (Section 5.3.3).

It is useful to keep in mind that the main strategy of QCA is to study diversity. The cases may have many features in common, which are not presented in the analysis although they affect the construction of the truth tables and the interpretations of the final logical statements. Accordingly, it is legitimised to ask whether minimised solutions are always the best for interpretation.

Considering the ‘minimisation power’ of modern qualitative data software one could easily be at risk of becoming infatuated with the volume of the data one can deal with and lose resolution for scope (see Seidel 1991, p. 107). However, the capability of QCA to condense much information may not be the most relevant advantage of the method. QCA’s potential in assisting the researcher in organising complex data, in clarifying previous interpretations of it and in discovering new ones may be a more important motivation for its use (Rantala and Hellström 2001). As in qualitative research in general – and even in the use of QCA – the researcher’s comprehensive ability is a more important tool than the computer. For the researcher, QCA is simply a tool that provides more insight on the data, not definite answers or interpretations.

The true advantage of QCA is the flexibility of the method to address different types of questions

asked: causal or non-causal. The hermeneutic approach to QCA shows that the existence of causal relations is not a precondition for the use of QCA. In fact, the potential of QCA is best realised, if QCA was to be applied to non-causal data that the researcher is very familiar with, especially the kind of data that she has collected herself and has an interpretative approach to from the very beginning.

Improving Applicability of the Method

The use of QCA may be laborious. As already mentioned (Section 4.1.1), within the hermeneutic approach to QCA the spiral of analysis and reinterpretation could go on and on, depending on energy and imagination. In the process one may, of course, get dizzy in the spiral. That is, the researcher may not know when to stop, why the analysis may prove out to be more laborious than expected. Experiences by Rantala and Hellström (2001) suggest that the analysis may not be worth continuing when the changing of any single categorisation does not result in major changes in the overall interpretation of the whole. They also argue that when working with QCA, the continuous processing of data simultaneously helps elaborate the theoretical framework, which helps to end the process.

A way to significantly reduce the amount of work needed is to only use it on data that is well organised, either theoretically or empirically. The more organised the data, the more easily it opens up to meaningful interpretations. Therefore, one may need and often even should use other methods of analysis prior to QCA. What is interesting, though, is that QCA also offers a good way to 'test' how well the data is actually organised (Rantala and Hellström 2001).

According to Richards and Richards (1998), the first stage of qualitative computing included 'descriptive-analytic' programs (e.g. NUD*IST) which established code and retrieve as the central mode of handling qualitative data. The second stage emerged from the recognition that coding is not an end in itself but that it can and should be used to assist theory-building. The new hermeneutic approach to QCA is about dynamically recording the changing knowledge of our data in

support of theory building. For such purposes, code and retrieve methods and QCA could well be used to supplement and support each other. That is, when analysing extensive qualitative data, coding methods may be used to pre-organise and pre-categorise the data for QCA analysis. The use of QCA would also benefit from being able to redefine categories with suitable software. At present, the main problem in combining these methods is technical. In order to be able to fluently move from code-and-retrieve methods to QCA and back, integrated software is needed.

Feeding data manually from one program to another is laborious and the operation of the QCA software is somewhat clumsy. The analysis conducted in this report suggests that there may be a need to do this hundreds of times within one research! Because of this, the use of QCA software requires strong commitment from the researcher to use it in an extensive analysis such as this one. Some of the most urgent improvements needed in QCA software, include:

- Ability to change the names of categories during analysis.
- Holistic presentation of results in a way compatible with the presentation in Table 4 in Appendix 5 (simultaneous overview of all statements and cases).
- Increasing the capacity of the program to conduct the Quine-McCluskey minimisation process with a slightly higher amount of categories with a normal PC.
- Offer alternative ways to treat contradictions.
- Option which would enable the researcher to conduct the hermeneutic analysis through one press of a button (now it takes separate analyses of two times the amount of categories used).
- Develop compatibility with the Windows system.
- Develop availability of outputs in graphic form.
- Integrate QCA with code-and-retrieve methods.

5.3.3 Results vs. Previous Research

Research on Forestry Conflicts

Keltner (1990, p. 319–320) emphasises the need to understand the nature of the struggles and the conditions under which disagreement escalates

to destruction. This implies that understanding the stages of the struggle spectrum, representing the increase of intensity (from mild differences to disagreements, disputes, campaigning litigation, and physical confrontation) allows us to adjust our style of communication to one that is most likely to lead to a settlement.

The findings of this research challenge Keltner's (1990) ideas in two respects. On the one hand, one could argue that owing to differences in conflict culture, societies tend to deal with the conflicts within different stages of struggle. On the other hand, it may be argued that because of differences in conflict culture, conflicts emerge through different societal processes in each case, and that these processes do not necessarily involve escalation of intensity.

According to Walker and Daniels (1997, p. 22), substantive, procedural and relationship dimensions are present in any conflict situation but with different emphasis. These three basic dimensions of conflict management are also notable in the model of conflict culture (Fig. 15 on p. 68). The 'stable-change' dimension refers to procedural aspects of conflicts, whereas the 'separatist-cooperative' dimension refers to relationship aspects of conflicts. Although the 'mild-intense' dimension does not directly refer to substantive aspects of conflicts, the results suggest notable connections between conflict themes and intensity. Interestingly, the findings of this research indicate a somewhat closer connection between the type of conflict and relationship aspects of the conflicts, than between the types of conflict and substantive or procedural aspects of the conflicts.

As the model by Walker and Daniels (1997) was used in the construction of the analytic frame, and as a basis for categorisation in the initial analysis with the empirical typology approach to QCA, these findings may not appear surprising. However, in the condensed data used in the subsequent hermeneutic approach to QCA, these three dimensions of conflict mixed with each other to such a degree that their appearance in the final model could not be considered as a direct consequence of initial categorisation.

The model of conflict management strategies (Fig. 16 on p. 69) also offers an interesting point of comparison with other conflict research. Most often, conflict research is based on the underlying

idea of conflicting (sub)cultures. This clash of conflicting (sub)cultures may be treated in an institutional or interactive manner (some literature may also refer to obligatory and voluntary approaches). These strategies fall on the left hand side of the model (Fig. 16 on p. 69), which is rather well covered in conflict literature.

Conflict prevention, avoidance or anticipation refer to efforts that aim at changing conflict culture towards reduced amount or intensity of conflicts. The cultural change aimed at, is bringing the hidden and potential conflicts into the open so that they can be managed through widely accepted procedures. In conflict literature, conflict prevention is typically considered to involve the development of institutional procedures as the means to change conflict culture. Such efforts may include, for example, public participation in land management planning, participatory policy processes, or forest certification. In the model of conflict management strategies (Fig. 16 on p. 69), this approach would mostly correspond to the top-right window; institutional approaches to managing conflict culture. This is also rather well covered in conflict literature.

The model of conflict management strategies (Fig. 16 on p. 69) suggests that in addition to the three well known approaches to conflict management discussed above, conflict management may also include a fourth dimension; the interactive management of conflict culture. By claiming that conflict management is an integral part of our every-day activities, most conflict literature acknowledges the basic idea of interactive management of conflicts culture. However, this idea has not been explored in any depth empirically or theoretically. Perhaps one reason for this is that most typically, environmental conflicts in forestry have been examined and understood as a phenomenon of conflicting (sub)cultures, without understanding of the underlying conflict culture of the society. Only comparative analysis of conflicts in broader cultural settings may bring forth this type of new dimension.

Reunala's (1986) Study

In this research, the dynamics of the conflict cultures could not be addressed within in the

analysis itself. However, an aspect of dynamics is brought by the ability to compare these results with findings from Reunala (1986, summarised in Reunala and Heikinheimo 1987 and Hellström and Reunala 1995) who conducted research on the same six countries as investigated in this research, during the precedent period of 1950–1983.

Reunala (1996) identified differences in the cultural role forests as affecting the intensity of the conflicts that occurred. He found that the cultural importance of wilderness areas (Finland and USA), the national economic importance of forestry (Finland and Sweden), and changes in the traditional role of public forestry (France) tended to intensify struggles related to forestry, whereas long forestry traditions (West Germany) and limited public rights related to forests (France and USA) tended to decrease then intensity of the conflicts.

Although Reunala did not specifically claim to investigate conflict cultures, it is interesting to see how well the findings of Reunala are compatible with the model of conflict cultures (Fig. 15 on p. 68) constructed within this research. As discussed earlier (Section 5.2.2), this model is based on three dimensions (mild vs. intense conflicts, polarised vs. constructive relations between conflict actors, and stability vs. change in society and forestry).

Reunala found very polarised relationships to exist between the major conflicts actors, and the isolation of the forestry profession from the rest of society was high in all cases except West Germany and Norway. He also noted that the conflicts within these cases were less intense than in the others. The strong connection between the type of relations and conflict intensity is also supported by the findings of this study.

Another factor that Reunala emphasised as a major background of intense conflicts (Finland, France, Sweden and USA) was rapid change in forest management practices (and with the exception of USA, also rapid societal change). This is interesting, because also in this research, dramatic change was strongly related to intense conflicts.

In fact, the model of conflict culture (Fig. 15 on p. 68) suggests that the most intense conflicts took place in conditions with simultaneous exist-

ence of polarised relations and dramatic change in society or in the use of forest resources.

If the cases studied by Reunala (1986) were positioned in the model of conflict culture constructed on the basis of the cases of this study, many of Reunala's (1996) cases (Finland, France, Norway and West Germany) would locate approximately in the same places as in this study, which suggests that conflict cultures are rather stable (changes in Minnesota and Pacific Northwest are difficult to evaluate, because Reunala focused on the whole of USA). A few interesting differences regarding how conflict culture in Sweden was understood between these two studies can still be found, suggesting that conflict cultures can change or be changed.

Reunala (1986) found the conflicts and their intensity in Finland and Sweden were rather similar during most of the period investigated (1950–1983). However, he also noted that at the end of the period investigated, the conflicts in Finland continued to be more intense than in Sweden. This change in conflict cultures is also recognisable in this research, where conflicts in Finland were more intense than in Sweden, despite many of the societal backgrounds that these countries have in common. In explaining the differences found between Finland and Sweden, Reunala noted that a stronger clash of values between environmental and social interests was detected in Finland than in Sweden, owing to differences in rural decline in these two societies. This difference related to value clash was also detected in this research (see categories 'CLAS' and 'AVOI' in Section 4.3.2).

The change in conflict culture in Sweden is also illustrated by the fact that Reunala (1986) found the isolation of the forestry profession as high in Sweden, whereas in this study, constructive relations was one of the aspects characterising the Swedish conflict culture.

Although the history of conflict management in the different cases varies, perhaps a few very general trends common to most of the cases investigated can be observed when comparing Reunala's (1986) findings and the findings of this study.

During the heated forestry debate that emerged in most Western countries in the 1960s and 1970s, conflict management approaches primarily focused on dispute resolution; the resolution of

specific environmental disputes between conflicting subcultures. Often, such institutional management of conflict culture was authoritarian, but arbitration based conflict management techniques were also developed. Gradually, however, the continuing and in some cases even the intensification of conflicts led to increased recognition of the value differences behind the conflicting subcultures. Although substance management continued to dominate, the need for relations management gained increasing recognition. A step was taken towards interactive management of conflicting subcultures.

In the 1990s, as conflicts have become increasingly understood as an important force behind social development, institutional procedures to capture the constructive potential of conflicts for social development have been developed. The growing interest in public participation and forest certification has marked an era of increasing emphasis on the institutional management of conflict culture.

Today, there is increasing recognition of the fact that such institutional approaches to the management of conflict culture do not necessarily reduce the intensity or amount of conflict to the degree expected. The increasing search for answers in this direction may gradually build a base for a new era in conflict management where the importance of interactive management of conflict cultures is also recognised.

5.3.4 Applicability of the Results

As environmental conflicts in forestry are of great concern to forest policy makers and forest related businesses throughout the world, there is pressure to adopt conflict management approaches or techniques developed in one country into another. Therefore, it is essential to know, to what extent can the findings of this research be generalised to other cases, particularly since suspicion about the 'external validity' of case study research has probably been the most important reason for reservations against its use (Barlow and Hersen 1987, p. 51).

Yin (1994, p. 36) notes that case study research should not implicitly be compared with statistical research where results obtained from investigat-

ing a sample can be generalised to the whole population. Therefore, Yin (1994) points out the difference between statistical and analytic generalisation. In analytic generalisation, generalisation does not occur in relation to the population but in relation to a theoretical frame (Tynjälä 1991, p. 390–392; Alasuutari 1993, p. 196; Yin 1994, p. 46). The importance of analytic generalisation instead of statistical is within this study also emphasised by the fact that conflict cultures are dynamic, and thus, bound to specific societies during specific periods of time.

The findings of this study are based on studies on six Western countries, all of which have significant forest resources. An interesting question is, to what extent does the analytic frame used, and the models of conflict management and conflict culture produced offer a basis for examining and evaluating conflict culture in other types of ecological, economic, social and cultural conditions than presented in this research?

In 1996, the Food and Agriculture Organisation (FAO) of the United Nations organised an electronic conference on "Addressing natural resource conflicts through community forestry" (Chandrasekharan 1997). The conference presented a wide variety of experiences from different types of conflicts in non-industrial countries on several continents. These examples provide a basis for identifying potential differences between the social, economic and cultural settings of the conflicts in non-industrial countries and the countries examined here.

In many non-industrial countries, the quality and amount of scientific information about forests and their uses may be different from the advanced countries studied here. For example, indigenous knowledge systems might be considered to be equally important systems of knowledge as 'Western science' (Banuri and Appfel Marglin 1993b). Value and interest related issues might also be more strongly affected by cultural factors. Considerable differences in the level of democracy and form of governance may also exist. For example, strong local institutions may supplement national level public forces. In addition, the competing economic, social and ecological demands and interests concerning the resource base may be different. Property relations, for example, may not only involve ownership, but

also tenure, access and traditional rights. The use of forest resources may also be strongly affected by accessibility and physical infrastructure. Moreover, it may not always be policies that set the frame for economic life, but also vice versa.

In many non-industrial countries, the most important conflicts related to forests may not be conflicts within forestry, which has been the main focus of this study, but conflicts between forestry and the ‘world outside’. This means that instead of conflict over the way in which forests should be used, the conflict may consist of whether the land should be preserved as forest or cleared to other purposes (see Kaarakka and Holmström 1999).

Differences related to conflict management strategies can also be found. In the following, they are discussed within the framework of the model of conflict management strategies (Fig. 16 on p. 69).

In some non-industrial countries, authoritarian forms of dispute resolution may not only be based on laws and authorities, but also on other social or even religious norms and rules. Thus, the institutional management of conflicting (sub)cultures may receive very different types of forms than in the cases of this study.

In many developing countries, the preconditions for interactive management of conflicting (sub)cultures may be lacking or insufficient. For example, the conflict actors may be either geographically or culturally so far apart from each other that direct communication channels may be difficult to establish. This is an aspect often forgotten by those working with conflict resolution in developed countries where multiple means of communication are available. Moreover, arbitrary or interactive dispute resolution methods developed within one culture may not always be

transferred to another cultural setting.

Community forestry with parallels to public participation methods is a typical form of institutional management of conflict culture in many non-industrial countries. However, it not only deals with participation but it is also a means of promoting improved livelihoods for communities, and for increasing the focus on socio-cultural issues, such as gender roles and divisions of labour.

The application of the strategy of interactive management of conflict culture implies awareness of the existing cultural setting of conflict. This cultural setting becomes more evident through intra-cultural communication. In many developing countries, the level of awareness of the existing conflict culture may be very different among various actors; eg. local tribes and global corporations. Subsequently, creating common understanding of the existing conflict culture may be the first step in interactive management of conflict culture. This is also the first step needed in many developed countries.

Although the model of conflict cultures (Fig. 15 on p. 68) and the model of conflict management strategies (Fig. 16 on p. 69) presented in this report do not provide a universal model applicable to all circumstances, it is despite the need for context-bound revisions far from useless in understanding conflict culture in other circumstances. It may raise important questions for policymakers and conflict actors, and thus, encourage self-evaluation, which is the basis for any successful conflict management. Moreover, it may encourage policy-makers to better understand the potentially positive role of conflicts and their constructive management for policy development and subsequently, lay ground for conflict management strategies for different types of cultural settings.

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Total of 106 references

Appendix 1. List of interviewees.

Finland

Aula Jukka, Lapin metsänhoitoyhdistysten liitto
 Eilavaara Erkki, Suomen Sahat ry.
 Filppa Jouni, Paliskuntain yhdistys
 Hautojärvi Sirkka, Ympäristöministeriö
 Heino Jan, Maa- ja metsätalousministeriö
 Härkönen Kerttu, Metsähallitus
 Ikonen Matti, Greenpeace
 Jantunen Tuomo, Suomen latu ry.
 Jokinen Hannu, Metsähallitus
 Joutsamo Esko, Suomen Luonnonsuojeluliitto
 Kaakinen Eero, Oulun ympäristökeskus
 Karjalainen Harri, WWF
 Karvonen Juhani, Suomen metsäyhdistys
 Kolehmainen Ilmo, Metsäkeskus Tapio
 Laine Pertti, Metsäteollisuus ry.
 Lindroos Heikki, Metsäteollisuus ry.
 Lohi Tommi, Koillis-Suomen metsälautakunta
 Manninen Tuomas, Iltasanomat
 Niskasaari Mikko, vapaa toimittaja
 Parviainen Kauko, Veitsiluoto Oy
 Palo Matti, Metsäntutkimuslaitos
 Paloniemi Jouko, Maa- ja metsätalousministeriö
 Pennanen Juho, Luonto-Liitto ry.
 Pölkki Voitto, Enso Oy
 Rantala Kaija, Helsingin kaupunki
 Rautiainen Martti, Kuusamon yhteismetsä
 Reunala Aarne, Metsäntutkimuslaitos
 Ruusu vuori Paavo, Suomen metsästäjäliitto ry.
 Salminen Pekka, Ympäristöministeriö
 Savola Keijo, Luonto-Liitto
 Seppänen Paavo, Metsälehti
 Simula Anna-Leena, Maa- ja metsätaloustuottajien Keskusliitto
 Valtanen Hannu, Suomen suurlähetystö, Bonn
 Veijola Pertti, Metsähallitus
 Wallenius Pauli, Metsähallitus

France

Barthod Christian, Ministère de l'Agriculture et de la Pêche
 Bonnier Jean, Forêt Méditerranéenne
 Bussy Jean Claude, expert forestier
 Capurro Marie-France, Maison de la Forêt Privée
 Costrel Yves, Fédération Nationale du Bois
 Delduc Paul, Ministère de l'Agriculture et de la Pêche
 Dereix Charles, Office National ds Forêts
 De Selve, Fédération Nationale des Propriétaires Forestiers
 Devos Patrice, Institut de Developpement Forestier

Dubourdieu Jean, Office National ds Forêts
 Gallemant Christophe, Office National ds Forêts
 Granger Yves, Ministère de l'Agriculture et de la Pêche
 Grelu Jacques, Délégation à la Protection de la Forêt Méditerranéenne
 Jaccaud Thierry, World Wildlife Fund For Nature
 Kempf Hervé, la Recherche
 Lebreton Philippe, FRAPNA
 Lerat François, Ministère de l'Environnement
 Lilin Charles, Ministère de l'Environnement
 Monomakoff Pierre, Fédération Nationale des Communes Forestières
 de Montgolfier Jean, Ecole Nationale des Ingénieurs des Travaux Ruraux
 Normandin, Mr. INRA
 Nougarede Olivier, INRA
 Ollivier Patrick, Forestiers La Rochette
 Piantanida Anne, Alsace-Nature
 Pointereau Philippe, FNE
 Rameau Jean-Claude, ENGREF
 Ravetta René, CRPF de Rhone Alpes
 Richer Yves, Office National ds Forêts
 Salvi Alain, Conservatoire des Sites Lorraines
 Sturm Jacques, Fédération des Pâtes
 de Turkheim Brice

Norway

Aakre Liv, Landbruksdepartementet
 Andersen Gjermund, Norges Naturvernforbund
 Andersen Jan Erik, FM. Miljøvernadv. Sør-Tr.lag.
 Bjella Olav, Statskog
 Bøe Steinar, LD
 Finstad Andreas, FMLA Sør Trondelag
 Haakenstad Helge, Oslo kommunsskoger
 Haga Atle, Miljøverndepartementet
 Hatlinghus Rolf, Løvenskiold W.
 Haugan Reidar, Siste Sjanse
 Hauge Kjell, FM. Miljøvernadv. OSlo/Ak.
 Haveraaen Oddvar, NLH
 Hofstad Ole, NLH
 Hvoslef Stig, World Wildlife Fund for Nature
 Hågvær Sigmund, NLH
 Kamfjord Finn, Fritzøe Skoger
 Karlsen Svein, FM. Miljøvernadv. N Tr. lag
 Kaveldiget Olav, Skogselskapet
 Kildebo Arne, Drammen komm. skog
 Langerud Bjørn, NISK

Moen Eli, FM. Miljøvernnavd. Buskerud
 Nolteberg Egil, Norges Skogeierforb.
 Pleym Frode, Natur og Ungdom
 Rørå Arne, Norskog
 Sannes Berit, Levende Skog
 Solbraa Knut, NISK
 Stang Thomas, Norskog
 Svendsrud Asbjørn, NLH

Sweden

Bohlin Jörgen, Svenska Samernas Riksförbund
 Eld Lars-Erik, Sågverkens riksförbund
 Eliasson Owe, Västerbottens Kuriren
 Elmberg Johan, Info/Skog SLU
 Eriksson, Skogsvårdsstyrelsen
 Gustafsson Lena, Skogforsk
 Hemberg Leif, Skogsvårdsstyrelsen
 Holmgren Anders, Näringsdepartementet
 Hugoson Maria, Svensk Skog
 Hultkranz Lars, Umeå Universitet
 Hultman Sven G., Upplandstiftelsen
 Hägglund Björn, Stora Skog AB
 Karström Mats, Steget Före
 Kjellin, Per, Skogsstyrelsen
 Leithe-Eriksen, Greenpeace
 Liljelund Lars-Erik, Miljödepartementet
 Lindahl Karin, Taiga Rescue Network
 Lindevall Bo, Skogen
 Lindhe Anders, World Wildlife Fund for Nature
 Ohlsson Stig & Larsson Tor-Björn, Statens Naturvårdsverk
 Pettersson J-O, Svenska Jägarförbundet
 Rudberg Jonas, Naturskyddsföreningen
 Sandström Erik, Skogsstyrelsen
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 Heisenbittel John, American Forest & Paper Association
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Appendix 2. List of interview themes.

1. Background Information

- the roles of forestry
- main principles in the use of forests
- forest ownership structure
- forestry in national and regional economies
- forest employment (e.g. forest technology)
- structure and characteristics of the forest industry

e.g. national programs and budgeting, private forestry programs, information and services, financial incentives, government regulation, public ownership

- changes in forest policy
e.g. who initiated and what necessitated the change, agreement and disagreements on the change

2. Forest conflicts and conflict management

- “conflict diary” (conflict “facts”)
- existence of various conflict types
- structure of conflicts (e.g. issues, themes and interests involved)
- attitudes and behaviour of the groups involved
- media attention of the conflicts
- conflict management (e.g. approaches and outcomes)

3. Conflicts in relation to values and interests

- public at large (e.g. environmental awareness)
- values and interests of major groups of conflict actors
e.g. communication, paradigms, attitudes towards conflict, uniformity/diversity of views
- behaviour of groups
e.g. contacts with others, demands, initiatives, and responses, information collection and dissemination, education and research

4. Conflicts in relation to policy process

- general changes in the policy process
- e.g. ideologies, power structures, stability, openness
- changes in policy participants and processes
e.g. international pressure, channels of influence, participation of new interest groups, public participation, role of the media
- sources of information
- equality in coverage of views

5. Conflicts in relation to policy goals and means

- general characteristics and trends
e.g. the relationship between forest and environmental policies, ownership rights, regulation vs. deregulation
- policy goals and strategies
- policy means

6. Conflicts in relation to policy implementation

- social structure as an obstacle for policy implementation
- resources for implementation of policy
- administrative structure and efficiency of implementation
- availability of suitable technology
- economic limitations e.g. markets
- attitudes of implementers
- acceptance of policy by various interest groups
- activity of pressure groups against or for policy implementation

7. Conflicts in relation to economic activities

- economic environment of forestry
e.g. changes in role of forests in the national and state economies, the price of wood, markets for non-wood products, cost development in forestry
- public market interventions in forest and environmental policy
- private market interventions (e.g. environmental consumer pressure)
- incorporation of non-economic values into the operation of the wood market

8. Conflicts in relation to the use of forest resources

- general forest characteristics
e.g. forest and wood resources, forest structure, existence of virgin and semi-natural forests, health and vitality
- debate related to individual forest management practices
- the use of forest resources (e.g. sustainability considerations)
e.g. wood production, felling, other material benefits (e.g. hunting, berries, mushrooms, etc.), ecological benefits and protection, other social and cultural benefits

Appendix 3. Categorisation.

a1: PROT. The protection of old-growth forests has been a dominant theme in all those countries where such forests exist abundantly. This conflict may have had many names and forms, such as mountainous forests (Sw), coastal conifer forests (No), wilderness areas (Fi), or ancient forests (PN) but the main issue in these cases was the same: the prevention of logging in remote areas with old-growth values. In other cases (Fr, WG, Mi), conflicts over old-growth forests were said to not exist, or they were more about modifying forest management than about the total prevention of logging.

a2: HARV. Forest management practices were debated in all cases of this study. Therefore, drawing lines between the cases was not easy. The categorisation describes the existence of the level of forest utilisation or forest harvest as a major conflict theme. The theme was coded as important only in two cases (Mi, PN). Indeed, in both cases, significant changes in harvest levels took place. To some extent, this categorisation also draws a line between the American cases where the forest management debate predominantly focused on public forests, and the European cases where forest management was a more general issue of debate.

a3: SOCI. The socio-economic impacts of forest protection were especially intensively debated in the two cases that had the most intensive conflicts (Fi, PN). In the other two cases with major struggles over forest protection in large areas (No, Sw), the livelihood of local communities was not discussed to the same degree.

a4: MULT. Most countries had individual conflicts related to multiple use issues, or urban forestry conflicts. However, in two cases (Mi, No), amenity use of forests was an important overall issue that was strongly related to most forest management conflicts throughout the period of study. The cases were not similar, however. In Norway, amenity use interests were mainly based on public rights, whereas in Minnesota, resort communities were also involved in the conflicts. Moreover, amenity use of forests was an issue that raised debate in specific areas close to urban centres (Fr). A further important multiple use theme closely related to environmental conflicts was reindeer herding (Sw). In Finland, reindeer herding was not a part of the environmental forestry debate to a similar degree.

a5: ROLE. Private ownership rights and the role of public forestry are affected by many forest management and protection decisions. Therefore, it is natural that the roles of private and public ownership were discussed as part of the more general environmental forestry debate. However, as a more independent issue with special weight, the role of public forestry was discussed in three cases (Fi, Mi, PN). In all these cases the goals of public forestry were also significantly reformed towards ecosystem management.

b1: PHYS. Physical on-site protests were coded to exist frequently only in those cases where multiple conflicts with NGOs trying to physically obstruct logging were well-known by name (Fi), or where the interviewees had already “lost count” on them (PN). In a few countries (Fr, No, Sw) individual on-site protests were mentioned but with a strong notion by the interviewees that the incidents that happened during these conflicts were very untypical for their countries. These cases were coded as not having frequent physical on-site protests, like the two cases where such conflicts were not mentioned at all (WG, Mi).

b2: LITI. In the USA (Mi, PN), litigation was rather frequently raised by environmentalists, in order to prevent forestry operations which they considered harmful. In the European cases, although litigation related to forestry conflicts were occasionally mentioned in relation to, for example, the implementation of forest management norms (Fi), compensation issues (WG), or indigenous rights (Sw), environmental NGOs were not judicially considered as involved parties. This would have been impossible in these countries already from a judicial point of view. This difference also marked an important basic difference between environmental forestry conflicts in cases of Europe and the USA.

b3: CAMP. Some conflict-related campaigning has most probably taken place in all cases of this study. The categorisation used here is, therefore, based on slight differences between the interviews conducted in different cases. In some cases, the existence of strong campaigning was rather evident as being supported by the views of several interviewees (Fi, PN, Sw). In others, the interviewees clearly indicated the lack of strong campaigning (Mi, No). However, in the remaining cases (Fr, WG), the issue of campaigning was not often taken up by the interviewees.

b4: MILD. The dominantly mild and discussion oriented nature of conflicts was very apparent in two

cases (WG, Mi) where little on-site protests or campaigning occurred. The opposite was very apparent in two cases (Fi, PN) where on-site protests and strong campaigning occurred.

c1: EXTN. Environmental interest external to the region in question played an important role in the conflicts in the Nordic countries (Fi, No, Sw; market pressure from Europe) and in the Pacific Northwest (political pressure from the Eastern States of the USA). In the remaining three cases (Fr, WG, Mi), most pressure was national or regional. However, it is important to note that West Germany was also an important source of environmental pressure to other countries.

c2: INDU. The forest industry could be involved in the conflicts as a producer of forest products, as a forest owner, or both. As a producer, the forest industry is always involved in the conflicts, to some degree. However, in two cases (Fr, WG) the forest industry was only involved as a producer, and not as a forest owner.

c3: ADMI. Struggles of competencies between forest and environmental authorities were mentioned as especially important aspects of conflicts in two countries (WG, Fr). In these cases, administrative struggles were particularly apparent in park management issues. Disagreements between administrations were frequently said to have effected the conflicts over forest protection in two additional cases (No, PN), although administrative relationships as such were not claimed to be a major source of conflict. On the contrary, administrative co-operation was very well reflected in the comments of the interviewees from the remaining cases (Fi, Mi, Sw).

c4: MEDI. The media was involved in the conflicts in all cases where on-site struggles occurred (Fi, Fr, No, PN, Sw). The most enduring national-level media attention of the conflicts has existed in the Pacific Northwest and in Finland, where the conflicts have involved plenty of on-site actions by the environmentalists. The few conflicts that have raised national-level media attention in France, Sweden and Norway have also mainly involved on-site actions (e.g. Njakafjäll in Sweden, Skotjernfell in Norway, and the Forest of Fontainebleau in France). As on-site protests have largely been lacking in Germany and Minnesota, the environmental forestry debate has not raised public attention at the national level, despite the public's general sensitivity to environmental issues. However, in Minnesota, the GEIS study raised the forestry debate to the state-level for a short period of time.

c5: DIVE. Other well organised interests than forestry or environmental interests, were involved in the conflicts particularly in the same cases where amenity issues were considered as important aspects of the conflicts (Mi, No). In Sweden, diversity of interests was brought by the involvement of the reindeer herding Sami. Although Native American tribes may be considered as important interest groups in the USA, they did not represent well organised interests in either of the cases in the USA.

d1: FRAG. The fragmentation of the environmental movement was strongly emphasised in the interviews of two cases. Such fragmentation could be visible in the wide differences and even conflict between radical grass root and national mainstream organisations (PN), or it could be more geographic, based on organisation around locally varying issues (Fr). In some cases with environmental pressure from abroad (Fi, No, Sw), or where part of the environmental movement was active internationally (WG), the national environmental movement was still rather homogeneous in its focus on national forestry issues.

d2: ECON. The national economic importance of the forest sector is considerably higher in Finland than in any of the other cases. Forestry is an important part of the national economy also in the other Nordic countries (No, Sw) but not quite to the same degree. Although forestry has great regional importance also in the Pacific Northwest, forestry conflicts occurred at a national scale where the importance of forestry was lower. In Minnesota, on the other hand, the economic importance of wood production and the forest industry is accompanied by strong economic importance of forest environment for the tourist industry.

d3: CMTY. Community values were visible in the interview material in two respect, as concern for the socio-economic impacts of increased forest protection for local communities (Fi, PN), and as sensitivity towards changes in the local environment, with a tendency to organise locally in order to influence forestry issues (Fr).

d4: PRIV. Private ownership rights were related to conflicts in two different ways: in relation to the rights of forest owners to decide upon forest management (Fi, Mi), and in relation to the involvement of forest owners in designing forest protection plans (Fr). Private forest ownership rights are very strong also in the Pacific Northwest, although they were not as apparent in the interviews as in Minnesota, owing to the concentration of the conflicts on public lands. Anyway, changing the

coding for Pacific Northwest would not have affected the grouping of cases.

d5: AMEN. Among the public, amenity values affected conflicts in two ways: as attachment to the surrounding environment and landscape (Fr, PN), or related to recreational activities (Mi, No). Although multiple use of forests is important also in other cases (Fi, Sw), multiple use values did not appear in the interviews to have had a major role in the conflicts in these cases. When it was mentioned, it was mostly regarded as reducing conflict rather than causing conflict.

e1: DIAL. Voluntary dialectic processes (e.g. discussion forums) aiming at a better understanding of forest values have been initiated as a conflict management strategy particularly in the early 1990s. These processes should not be confused with information dissemination campaigns that aim at value or attitude changes. Not specifically aiming at policy or management implications either, they should also be separated from public participation processes in decision-making. Concrete examples of such processes at the national level were mentioned in the interviews in relation to four cases (WG, No, Mi, Sw). In other cases, dialectic processes may have been initiated only at some localities (PN), or such institutional arrangement for value dialogue did not come up in the interviews (Fi, Fr).

e2: COOP. The level of co-operation between environmental and forestry interests is difficult to assess on the basis of the interview material, because at least a few co-operative projects were mentioned in relation to each case. Therefore, only large-scale co-operative projects over sectoral borders and related to multiple issues (Mi, No) were used as the major criteria for such coding. However, in Sweden, co-operative approaches with smaller scale were found to such extent that it could have been coded in the same group as well. Yet, after testing the analysis with both codings, it was found that the coding of Sweden in this respect would not have had any significant impact on the analysis or interpretation.

e3: PUBL. Not all value communication related to conflicts occur between involved conflicts partners. In addition, values are communicated towards the public through different channels. The media may act as an important channel for such communication especially in the case of continuous media attention (Fi, PN). To some extent, the conflict partners may 'use' the media to communicate their views, but media may also have goal of its own when acting as such a channel. In addition to the media, also direct campaigning towards

the public has been used (Fr) in order to influence the views of the public.

e4: PROC. Policy or land management planning processes also offer formal channels for value communication. In cases where committees made a major reform of forest policy or working groups representing a variety of forest related interests (Fi, Mi, Sw), value communication through policy processes has been self-evident. Public participation in land management planning is another arena for value communication, organised by the public sector. Public participation may be required by legislation (Mi, PN), or may be voluntary (Fi). In other cases, public participation may also have been used in relation to special areas (e.g. urban areas) with high conflict potential, although they are not recognised in the coding as general policies.

e5: JUDI. Judicial channels are also arenas for value communication in such cases where they are frequent and where judicial decisions form the basis for the interpretation of legislation (Mi, PN). In those European cases where litigation existed it was related to solving individual issues (Fi, WG, Sw) that did not directly involve the environmental norms of forestry or the designation of protection areas.

f1: TRAD. The length of traditions of the forestry profession were most often referred to in the cases that represent the two extremes (Fr, WG, and Mi, PN). Although in the Nordic countries (Fi, No, Sw), forest use has long traditions, the forestry profession is still rather young in comparison to Central European countries. However, they still have many traditions in common.

f2: COOP. See e2.

f3: ENFO. Within the forestry profession, organisations promoting close-to-nature forestry (e.g. Arbeitsgemeinschaft Naturgemässe Waldwirtschaft, Pro Silva) have strengthened particularly in Central Europe (Fr, WG). In the Nordic countries, such organisations are rather small, if existing at all, and in the USA, such larger organisations are limited to Forest Service staff and not the whole forestry profession.

f4: MIXI. A mix of professionals with different background has been promoted most strongly by the Forest Service in the USA (Mi, PN). In the Nordic countries (No, Sw), the forest industry has begun to employ ecologists particularly in the 1990s, and the industry has even had environmental activists to train their forestry personnel in detecting natural values. In the remaining cases (Fi, Fr, WG), there was still rather little mixing of professionals with different educational

background, except for tasks related to park management, for example.

f5: COUN. On the other side of the coin, although many of the interviewees were anxious about the developments described above, some on both sides opposed all co-operation. Although the constructive developments described above are often supported by the majority, typical voices of criticism include 'seeking legitimisation' and 'giving up on the fight'. Mostly, such comments were heard from individuals, but in a few cases, small groups within the forestry sector have organised for 'counter-attacks' against environmentalism (Fi, PN).

g1: FUNC. Policies aiming at the protection of nature values in forests have adopted two main strategies: forests are set aside from wood production, and limits for environmental impacts of forest management are defined. There is significant variation in the application of these strategies in different countries, and whether they are perceived as alternative or complementary. For example, individual forests may have different functions (e.g. receive different levels of protection) through different legislation (WG), or large areas receiving special consideration in forest management (even partial protection) may be defined within the forestry legislation (No). Alternatively, forests may be perceived as either protected or managed, in a more polarised way (Fi, PN, Sw). In some cases, no particular debate was found around this subject (Fr, Mi).

g2: ENVI. This category differentiates between the environmental policies of different cases. In the USA (Mi, PN), for example, some of the litigation has been claimed to be related to the dispersity of environmental legislation and even contradictions therein. On the other hand, European countries (Fi, Fr, WG, No, Sw) have long traditions in having comprehensive nature protection legislation.

g3: PROT. The level of protection was intensively discussed and policy processes to develop large scale forest protection programmes have taken place in all those cases where substantial debate took place over the protection of old-growth forests (Fi, No, PN, Sw). In the Nordic countries (Fi, No, Sw) such protection has been based on agreements between different interest groups, whereas in the Pacific Northwest, protection has first been enforced through the judicial system, and finally decisions have been made at the political level. In Germany, for example, the degree of protection within designed areas was a slightly more important aspect of debate.

g4: MULT. In the Central European countries (Fr, WG), the forestry legislation has already given principally equal weight to the wood production, protection and recreation functions of forests already prior to the period investigated. As most environmental demands upon forestry are not in contrast with these goals, little pressure for revision of forestry legislation has existed because of the conflicts. In the Nordic countries (Fi, No, Sw) forest policy was in the 1980s still based on primarily economic utilisation goals both in the public and private forests. Although such legislation may have included environmental aspects, they were clearly subordinated to wood production goals (Sw, No).

g5: REGU. The level of regulation in private forestry has been an independent issue from the use of different forest management practices in cases where regulation of private forestry is very limited, thus, creating pressure to increase regulation from an environmental point of view (Mi). Here, such cases were only coded where forest management was strongly regulated for wood production purposes, and there was pressure to decrease regulation owing to environmental concern (Fi, Sw). In some of the remaining cases (Fr, WG, PN), private forestry is regulated from an environmental point of view to some degree, but there is little pressure to revise the level of regulation.

h1: REFO. Modern forest management legislation with equal emphasis on wood production and ecological goals were enacted through widely participated processes in three cases. However, each revision resulted in slightly different types of policies. First, multi-functional goals were set but no norm control to implementation of the policy (Mi). Second, multi-functional goals were set by practical measures to implement them were unbalanced (Fi). Thirdly, legislation focused on economic and ecological goals with less focus on social aspects (Sw). In those countries with a long tradition in multi-functional legislation, no major reform took place (Fr, WG). In the remaining cases (No, PN), developments in forest policy were more gradual and not stressed by the interviewees.

h2: PUBL. Revisions of public land management goals have taken in all countries having substantial public forests. However, reforms have taken different forms. In the USA (Mi, PN), the new ecosystem management approach set new, broader goals for public forestry. Increasing emphasis given to public participation has supported this development. In Finland, the goals of the Forest and Park Service were also re-

designed towards multi-functionality, and experiments with public participation were begun. Sweden has also faced a substantial revision of public forest ownership. However, instead of incorporating economic, ecological and social goals into the activities of the Forest Service, management forests were transferred into industrial ownership.

h3: INCE. The attitude towards economic means to secure environmental values was three-fold. In most cases (WG, Sw, Fi, No, PN), financial subsidies have been re-allocated, to some extent, in favour of ecologically responsible forest management, or specific cost-share programs have been developed. This may occur either through specific ecological programs or through legislation. In other cases, economic instruments were not emphasised as a major means of forest policy by the interviewees (Mi, PN), or it was claimed that they have not been revised from an environmental point of view, to any large degree (Fr).

h4: INFO. Major information or education campaigns focused upon the forest sector at large have been used to support policy change particularly for three cases (Mi, No, Sw). Information strategies related to conflicts may have two main targets, the forestry profession at large, the professionals of a single organisation, or the public at large. In the Scandinavian countries (No, Sw), comprehensive education programs of the forest sector were launched. In Sweden, the campaign Richer Forest was focused upon the whole forest sector, and a similar one in Norway followed it. In Minnesota, extensive education has taken place in relation to the implementation of recommendations related to best management practices, and logger certification systems were initiated. In most other cases, the education of the forestry sector has taken place at organisational levels.

h5: IMPL. Changes in forest policy do not usually have dramatic over-night affects on the use of forest resources, because new regulations often only confirm developments that have already occurred in the implementation of previous forest policies. Conflicts may also either promote (Mi, PN, Sw) or obstruct the implementation of a policy (Fi) (positive and negative implementation effects of conflicts), or both (Fr). In the remaining two cases (WG, No), policy implementation was not regarded as a major conflict issue. Instead, gradual developments in policy implementation were said to take place in these cases.

i1: POLT. In some countries, political parties may be important actors in environmental forestry con-

flicts. This may be the situation particularly when extremely conflicting forest policy issues are decided upon at the national level (PN), or when the traditions of representative democracy, in contrast to participatory democracy, are very strong (WG). Moreover, even if the content of forest policy has not been a major issue of political debate, political changes may be reflected in the frequency of policy change (PN, Sw). On the other hand, political power changes may have affected administrative organisation (Fr) but not the goals of forest policies. In the rest of the cases, political interests have not had a significant impact on the conflicts or forest policy (Fi, Mi, No). Owing to the great difference in level of involvement of political actors in the conflicts, Pacific Northwest was coded as different from all other cases.

i2: ADMI. Significant conflicts may also exist between the forestry and environmental administrations. This was especially pointed out by the interviewees in two cases (Fr, WG). Some of them even considered these conflicts more severe than the factual ones. Administrative struggles have also affected forestry conflicts in Norway and the Pacific Northwest. In the remaining cases (Fi, Mi, Sw) such conflicts were less apparent. Accordingly, they were coded as co-operative participants in forest policy development.

i3: INTR. The media attention of the activities of environmental NGOs, as well as their growing support and resource bases has facilitated their integration into the political culture. Subsequently, representatives of environmental organisations have in some countries (Fi, No, Sw, Mi, PN) begun to be regularly called upon to participate in official policy formulation work. In other cases (Fr, WG), even though environmental groups have usually been reserved the right to be heard, they may not be invited to participate in the formulation process as official committee members.

i4: PUBL. Participation has not only been introduced to policy-making processes, but also to forest management planning. Public participation has been required from the USDA Forest Service (Mi, PN) by law since the 1970s, whereas in Finland the Finnish Forest Service has initiated such processes more recently, as a voluntary conflict prevention strategy. In most other cases, some form of public participation has also guided the management of public forests near conurbations. See also h2.

i5: SCIF. The scientific community is involved in most forest policy decisions. However, reliance on scientific work has been especially apparent in the USA

(Mi, PN), where the scientific community at large has been assigned the task of preparing a comprehensive background document for major policy decision.

j1: ENVI. In countries where environmental awareness is high, there is a strong basis for the use of market instruments as channels of conflict and conflict management. Forest products markets have been environmentally most sensitive in West Germany, which has been the leading country of international criticism of forestry from an environmental point of view. Germany is also one of the most important customers of the Nordic forestry industry, which has significantly increased the environmental sensitivity of the forest product markets of Nordic countries (Fi, No, Sw). The forest products markets in the 1980s and early 1990s were not as sensitive from an environmental point of view in the USA (Mi, PN) and France.

j2: EXPO. From the cases of this study, the Nordic countries (Fi, No, Sw) are clearly more export oriented than the other cases. Although some other cases are also exporters, exports did not raise into any significant environmental conflict issues in these cases.

j3: PULP. The forest industry as a forest user has different types of structure in each case. The pulp and paper industry is very dominant in the Nordic countries (Fi, No, Sw) and Minnesota. In the Pacific Northwest, the sawmill industry has been mostly in focus in the conflicts. In Germany, on the other hand, pulping is of minor importance compared with mechanical wood processing, whereas pulping is important in many areas of France.

j4: INDU. The forest industry is involved in market related conflicts through two roles: only as a manufacturer of forest products (Fr, WG), or also as a wood producer (forest owner) (Fi, Mi, No, PN, Sw). Possibly, the interest of the forest industry in forest management issues is higher in such cases where the forest industry is a forest owner itself.

j5: NONW. In all cases, forest based markets largely rely on wood and wood products. However, in two cases, markets of non-wood products (Fr) or services (Mi) have such regional importance that they may be of equal economic importance of wood and wood products. Depending on other circumstances, this may intensify or decreased conflicts related to forestry.

k1: WOOD. Conflicts may affect wood markets by reducing the availability of wood in areas under conflict. These restrictions may be enforced by political or judicial decisions (PN), or they may be caused by image (Fi). In the case of large areas, such as in the

Pacific Northwest, conflict may also impact the price of wood. When conflicts led to significant reduction in logging in public forests in the Pacific Northwest, the price of wood increased throughout the country (e.g. Mi). In Germany, on the other hand, tropical timber bans have significantly increased the prices of domestic substitutes, particularly beech.

k2: PRIC. As a result of conflicts, the level of wood prices was dramatically increased in the two cases of the USA (Mi, PN). In the Pacific Northwest, the changes rather were direct impacts of reduced harvest levels, whereas in Minnesota, in addition to reflections from the Pacific Northwest, the dramatically increased demand for wood also impacted wood prices.

k3: PROD. Particularly within environmentally sensitive export markets, there is an attempt to attach environmental values to the market values of forest products. This is done particularly by setting pressure on the intermediate customers of the forest industry (e.g. printing houses, publishers, retail stores) who operate under the threat of direct consumer pressure (Fi, No, Sw).

k4: PROF. Profitability crisis may exist in forestry (Fr, WG) or within forest products markets (Fr). Such crises may either increased pressures to intensify forestry, or reduce the intensity of forest management owing to the need to reduce costs. In Germany, the recent profitability crisis of forestry tended to indirectly decrease the intensity of the conflicts, as the fear for economic risks caused by, for example, storm catastrophes and forest decline has introduced more environmentally conscious forest management (e.g. increased natural regeneration, preference of mixed and uneven-aged stands). In Norway, planting has also decreased as a result of changes in both the price of wood and preference of natural regeneration from an environmental point of view.

l1: IMAG. In order to impact the values and attitudes of customers and consumers, both the forest sector and environmentalists have launched several image campaigns. The image campaigns of environmental NGOs are often characterised by international co-operation, or they may even be internationally co-ordinated (e.g. the Taiga Terminator campaign). When aiming at impacting international markets, the forest sector has mostly responded through co-operation on the national front (e.g. PlusForest, Initiative Forst und Holz, Le Bois Avance).

L2: HOTS. Direct action has in some conflicts been clearly motivated by the media attention that they

raise, and the impacts they have on public opinion and the pressure they place on decision-makers. In some cases, this has also clearly guided the selection of 'hot spots'. A strategy used especially by environmental networks in countries (Fi, No, Sw) depending upon environmentally sensitive export markets has been to make their demands public through the use of such hotspots. In some other cases (PN), hotspots may also have been used to create pressure on policy transformation.

l3: EXPE. An important background in the use of market tools in conflict management is the attitude of the forest sector towards green markets. Positive expectations on the use of market tools were found in cases where the forest industry already had positive experiences of (Sw) and in cases where market tools were discussed in a situation with rather little market pressure (Mi).

l4: CERT. Although having been initiated as a conflict management strategy, forest certification initiatives have also introduced new conflict potential. Forest certification has been discussed in all cases, to some degree. However, processes aiming at the creation of certification criteria or systems were initiated only in two cases (No, Sw).

m1: RESO. The scale of the forest resource has many dimensions. For example, the Nordic cases (Fi, Sw, No) have a high amount of forests per inhabitant. High forest coverage in some cases (Fi, Sw, Mi) makes forests a dominating landscape and environment.

m2: OLDG. Contradictions related to the preservation of old-growth forests have dominated the discussion in countries where their existence has been threatened by forestry (Scandinavia and the Pacific Northwest). On the other hand, a struggle over forest management practices has been dominant in countries, where practically all forests have been formed by human influence (e.g. Germany and Minnesota).

m3: PROT. In some countries, significant areas of forest were already protected during the wilderness debates of the 1970s and early 1980s (Fi, Sw, PN).

m4: PARK. The management of parks and other designated areas raised concern particularly in three cases. In Germany and France, struggles of competencies over park management existed particularly between the forest and environmental administrations, whereas in Norway, forest management and special regulation in Osloomarka, near the capital, was a particularly important issue of debate.

m5: UNEV. The dominance of different types of

management regimes, uneven-aged management (Fr, WG) and even-aged management (Fi, Sw, No, PN, Mi) is largely based on ecological differences. However, the management regime also affects changes in the landscape, and many other forest characteristics (e.g. choice of tree species), and may, as such, affect the types of conflicts occurring.

n1: PROT. Increase of protection areas has taken place in all cases with significant forest resources. Although there are differences in the degree of protection increased (PN, Fi, Sw, No), the countries with old growth battles considerably differ from the other cases in this respect (Fr, WG, Mi).

n2: PUBL. Pressure to revise the goals for public forestry has existed in several cases (Fi, Fr, Mi, PN). A very different type of development took place in Sweden when state forests were transferred to the ownership of state-owned forest industries. In the remaining cases (WG, No), major reforms may have taken place in relation to community forests.

n3: PRIV. The conflicts have also affected the use of forest resources and the structure of the forests more directly. This impact has been particularly strong in the Scandinavian countries, where changes in forest management have in many cases been clearly visible. Despite a trend towards more ecologically sustainable forestry in other countries as well, the impact of conflicts is difficult to separate from other influences. For example, as mentioned earlier, the profitability crisis of forestry and economic risks related to previous forestry management practices also supported a shift towards more environmentally sensible forestry in Germany.

n4: HARV. In two cases, conflicts have been related to significant changes in harvest levels; they may even have caused dramatic decreases of harvest levels (PN), or dramatic increases of harvest levels may have been a major issue of conflict (Mi). In the other cases, changes in harvest levels have been increasing or decreasing steadily, although storm catastrophes have caused some temporary peaks (Fr, WG).

o1: PUBL. Public right of access is a long tradition in the Nordic countries (Fi, No, Sw) where the public to freely enjoy their forested environment and where the public is, thus, interested in forests as a public resource. However, there are also some differences between public rights in the Central European countries (Fr, WG) and the USA cases (Mi, PN).

o2: NONW. Commercial non-wood use of forests was characteristic for three cases. In the USA (Mi,

PN), it was related to recreational use and tourist industries, and in France, it was related to products, such as mushrooms.

o3: INDI. Indigenous people have significant rights to forests in the USA (Mi, PN) and in the Nordic countries. However, there are major differences in the role of the reindeer herding Sami and forestry between the Nordic countries. In Sweden, only the Sami have rights to practice reindeer herding. This has made the relationship between reindeer herding and forestry rather conflicting. In Finland, however, reindeer herding is not limited to the Sami. Moreover, migration of reindeer is more limited owing to different herding traditions. These aspects make reindeer herding conflicts significantly milder in Finland than in Sweden. In Norway, reindeer herding mostly takes place in non-forested open areas with less conflict potential related to forestry.

o4: CMTY. Community dependence on forest resources was evident in the conflicts in two cases (Fi, PN). In the Pacific Northwest, community livelihoods and ways of life were at the core of most of the environmental forestry debate. Moreover, local communities even had some legal rights to the income from public forests. In Finland, community dependence of forestry was very high in the northern and eastern parts of the country. Particularly tense conflict issues were related to the protection of forests owned jointly by the majority of community members.

o5: INDU. See j3.

p1: AUTH. Authoritarian solutions (e.g. police and courts) to conflicts were sought particularly in three cases. In the cases from the USA (Mi, PN), court injunctions were frequently used to resolve conflict situations. Moreover, in the on-site protests in the Pacific Northwest and Finland, the police were also involved in seeking resolution on-ground.

p2: SCIF. See i5.

p3: NORM. Major normative changes took place either via new regulations in the forestry act (Fi, Sw), new recommendations (Mi), or in relation to public land management (Mi, PN). Normative changes in the remaining cases were more gradual.

p4: PRAC. Changes in practises is also a means of substance management: changing the substance of conflict. This action-oriented conflict management strategy was typical of all cases other than France and the Pacific Northwest (see n3).

p5: INFO. Information dissemination through joint campaigns of the forest sector towards the public at large was used as a conflict management strategy particularly in three cases (Fi, Fr, WG).

q1: COMM. A typical way of responding to conflicts by setting up a conflict resolution committee took place particularly in the cases of the USA (Mi, PN) and Finland. Often, such committees resulted in further revision of policies. Therefore, they may be perceived as process-oriented rather than relations-oriented.

q2: PART. See i4.

q3: INTG. Voluntary processes involving a wide variety of interest groups took place particularly in Norway (Living Forest) and in Minnesota (GEIS and subsequent processes).

q4: POLI. See h1.

q5: CERT. See l4.

r1: ARBI. Conflict arbitration was typical for cases in the USA (Mi, PN).

r2: DIAL. See e1.

r3: COOP. Here, the classification of 'co-operation' differs from the classification used in f2 where large-scale co-operative projects (Mi, No) were used as the major criteria. Here, also France is included owing to special agreements on co-operation between environmental NGOs and the forestry administration. However, changing the coding here would not have had significant impacts on the groupings.

r4: MIXI. See f4.

r5: EDUC. See h4.

Appendix 4. Qualitative Comparative Analysis (QCA).

History and Applications

Qualitative Comparative Analysis is a comparative method that uses Boolean algebra to systematically compare dichotomously categorised data on “more than a handful of cases”. Instead of numeric analysis, QCA is based on formal mathematical logic. For this reason, Ragin (1994a) frequently emphasises that by systematising the analysis of qualitative data, QCA ‘bridges’ some of the methodological gap between qualitative and quantitative research.

In the groupings of qualitative analysis software QCA is typically classified as a theory-building approach. The analysis allows the researcher to make connections between previously built categories, to develop them further, and to formulate and test them (Miles and Weizman 1994, p. 312).

Ragin presented his first application of QCA in the 1980s but the technique itself was not thoroughly explicated until 1987 (Ragin 1987). Since then, QCA has been applied in the social sciences on a wide spectrum of themes (bibliography of early QCA applications in Ragin 1994a).

QCA has primarily been used for re-analysing previous research and data collected by other researchers. For example, Ragin has used QCA to re-analyse the findings of Gøsta Esping-Andersen’s work on differences among welfare states in advanced capitalistic democracies (Ragin 1994c), Robert Wade’s research on village-wide collective action (Ragin et. al 1993), William Gamson’s work on the strategies of social protest (Ragin 1989). Furthermore, Hellström (1998a) has used QCA to re-analyse Reunala’s work on environmental conflicts in forestry. Musheno et al. (1991) have used QCA to investigate AIDS-related court rulings. Coverdill and Finlay (1995) have applied QCA to labour management in Southern textile manufacturing, and Wickham-Crowley (1991) has applied QCA to Latin American revolutions, just to mention a few.

This list of applications also reveals that QCA has mostly been used by researchers from the USA, and that the method has not gained a similar status in European social and political research.

Technical Illustration

Below, a technical illustration with hypothetical data is presented. The illustration is adopted from Hellström (1998a, also presenting an illustration with actual data on environmental conflicts in forestry).

A basic requirement for the use of Boolean algebra as the technical instrument for comparison is that variables are presented in dichotomous form: Capital letter variables indicate the presence of a causal condition or outcome, and lower case variables indicate the absence of a causal condition or outcome. From the data, a ‘truth table’ is constructed.

In the example truth table (Table 2), each case is described by joining three independent variables (a/A, b/B and c/C) with the logical operator ‘and’ (marked with ‘*’) to produce the outcome variable (x/X). Accordingly, each row forms a causal equation. Cases with similar values for all variables are considered as one group, which is presented in one row.

For example, the third row ($A*b*C \Rightarrow x$) in the example truth table (Table 2) would be interpreted as “the simultaneous presence of condition A, *and* the absence of condition B, *and* the presence of condition C *produces* the absence of outcome X.”

In the truth table (Table 2), all possible combinations of values of the independent variables are present, and two similar rows do not exist. Although there are 30 cases in total, the number

Table 2. Example truth table.

Row no.	No of cases	Independent	Variables	Dependent
1	6	$A * B * C$	$\Rightarrow$	X
2	2	$A * B * c$	$\Rightarrow$	X
3	3	$A * b * C$	$\Rightarrow$	x
4	8	$A * b * c$	$\Rightarrow$	x
5	1	$A * B * C$	$\Rightarrow$	X
6	5	$A * B * c$	$\Rightarrow$	x
7	2	$A * b * C$	$\Rightarrow$	X
8	3	$A * b * c$	$\Rightarrow$	x
Total	30			

of rows with differentiating values for the independent variables equals $2^3 = 8$. The rows that produce x can be derived from the rows that produce X , and vice versa. Therefore, the analysis only needs to focus on those types of cases that produce either one of the outcomes X and x .

The analysis is based on two subsequent minimisation procedures. First, all groups receiving the value X for the dependent variable are combined into one equation by joining them with the logical operator 'or' (marked with '+'):

$$A*B*C + A*B*c + a*B*C + a*b*C \Rightarrow X \quad (1)$$

This equation can be interpreted as follows: the combinations of conditions that are simultaneously present in Group 1 ($A*B*C$), or Group 2 ($A*B*c$), or Group 5 ($a*B*C$), or Group 7 ($a*b*C$) produce X . With the help of Boolean algebra, this equation can be minimised into a simpler one. For example, the combination $A*B$ receives the same value X regardless of whether it is combined with c or C (see rows 1 and 2 in Table 2). Thus, $A*B*c$ and $A*B*C$ combine to produce $A*B$. This minimisation is based on the principle that if two groups receive similar values for all other variables except one, this deviating variable can be excluded (for more information see Ragin 1987, 1994a). Correspondingly, $A*B*C$ and $a*B*C$ combine to produce $B*C$, and $a*B*C$ and $a*b*C$ combine to produce $a*C$ (Fig. 17).

Thus, a minimised equation is received:

$$A*B + B*C + a*C \Rightarrow X \quad (2)$$

The second minimisation process of QCA is based on the construction of a Minimisation Chart. This chart indicates how many of the minimised configurations are needed to explain the

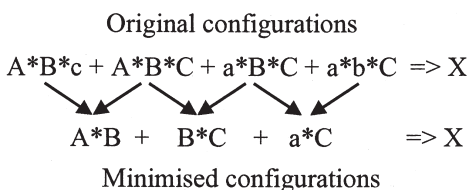


Fig. 17. The minimisation process.

Table 3. Example minimisation chart.

Minimised configurations	$A*B*C$	Original configurations $A*B*c$	$a*B*C$	$a*b*C$
AB	✓	✓		
BC	✓		✓	
aC			✓	✓

✓ = The minimised configuration is part of the original configura-

whole variation that exists among the original configurations. In order to illustrate the second minimisation procedure, a chart is constructed (Table 3) from the configurations of the original equation, and the configurations of the minimised equation (Fig. 17). The goal of this second phase of minimisation is to find the smallest possible number of minimised configurations needed to explain the outcome X (for more information see Ragin 1987, 1994a). When a minimised configuration is part of an original configuration, it is marked with '✓' in the chart (Table 3). In this example, either one of the minimised configurations $A*B$ or $a*C$ is present in all the four original configurations. Thus, the configuration $B*C$ can be excluded from the final equation which receives the following form:

$$A*B + a*C \Rightarrow X \quad (3)$$

This equation can be interpreted as follows: either the simultaneous presence of conditions A and B or the simultaneous absence of condition A and the presence of condition C produce the presence of condition X . Accordingly, QCA has enabled us to minimise equation (1) into a considerably more simple equation (3) without losing any relevant data during the minimisation processes.

When conducting the analysis of the new data with QCA, only the truth table with original data (Tables 1A–1F and 3 in Appendix 5), and the final solutions are presented (Tables 2A–2F and 4 in Appendix 5). The rest is technical procedure performed by the computer.

For illustrative reasons, the example presented above is simplistic. Moreover, QCA can be used for grouping cases into categories, and for systematic comparisons of initial hypotheses with results (see Ragin 1987). Ways to include quantitative data in the analysis have also been developed (Ragin 1994c).

Benefits and Problems

Typical applications include causal analysis of macro-sociological phenomena. In traditional applications of QCA, causation is viewed as multiple conjunctural. This means that there can be different combinations of causal conditions that produce similar outcomes.

Despite the causal orientation of the typical QCA applications, the method has many indisputable advantages by paying attention to: (1) cases as configurations; (2) causal conjunctures; (3) causal heterogeneity; (4) deviating cases and concern for invariance; (5) qualitative outcomes; and (6) outcome complexity (Ragin 1994a, p. 304–308).

The greatest problems related to QCA are not based on the technique of the method, but on the

limited ways in which it has been applied. QCA seems to suffer from a vicious circle where the starting point of causal applications with inherited data may have caused general prejudice against the method among many non-causally oriented qualitative researchers, which, in turn, may have promoted the causal use of the method even further. Moreover, the causal applications of the method are commonly applied to ‘inherited data’ which again limits the researcher’s ability to ‘play’ with the data.

Because nearly all QCA applications so far have focused on macro-sociological phenomena and have been based on the notion of causality, it has not been generally recognised that QCA can also be applied in non-causal analysis. Such models of application are presented in Section 4.1.1. (see also Rantala and Hellström 2001).

Appendix 5. Truth tables and tables of results.

1. Truth tables for the empirical typology approach to QCA: grouping the cases

1A. CONFLICT TYPES

No.	Substance	Code	Fi	Fr	Mi	No	PN	Sw	WG
<i>Conflict themes</i>									
A1	Protection of old growth forests as dominant conflict theme	PROT	1	0	0	1	1	1	0
A2	Level of forest use and harvests as major conflict issue	HARV	0	0	1	0	1	0	0
A3	Social impacts (e.g. employment, communities) of forest protection as major conflict issue	SOCI	1	0	0	0	1	0	0
A4	Multiple use of forests (e.g. recreation, urban forestry, reindeer herding) as important conflict issue	MULT	0	1	1	1	0	1	0
A5	The role of public forestry as a major conflict theme	ROLE	1	0	1	0	1	0	0
<i>Conflict intensity</i>									
B1	Frequent physical conflicts (e.g. on-site protests)	PHYS	1	0	0	0	1	0	0
B2	Frequent litigation on forest management or protection	LITI	0	0	1	0	1	0	0
B3	Strong campaigning	CAMP	1	0	0	0	1	1	0
B4	Mild, discussion oriented conflicts	MILD	0	0	1	0	0	0	1
<i>Conflict actors</i>									
c1	Involvement of environmental interests external to the region	EXTN	1	0	0	1	1	1	0
c2	Involvement of the industry as a forest owner	INDU	1	0	1	1	1	1	0
c3	Conflicts between administrations	ADMI	0	1	0	1	1	0	1
c4	Media interest at local or national level (also indicates the existence of frequent or occasional on-site protests)	MEDI	1	1	0	1	1	1	0
c5	Strong involvement of organised interests other than environmental or forestry interests	DIVE	0	0	1	1	0	1	0

1B. VALUE ASPECTS

No.	Substance	Code	Fi	Fr	Mi	No	PN	Sw	WG
<i>Value dimensions</i>									
d1	Fragmented environmentalism	FRAG	0	1	0	0	1	0	0
d2	National economic value of forests	ECON	1	0	1	1	0	1	0
d3	Community values	CMTY	1	1	0	0	1	0	0
d4	Private ownership values	PRIV	1	1	1	0	1	0	0
d5	Amenity values	AMEN	0	1	1	1	1	0	0
<i>Value communication</i>									
e1	Arenas of projects for open value dialogue	DIAL	0	0	1	1	0	1	1
e2	Co-operation	COOP	0	0	1	1	0	0	0
e3	Communication through the public (media and campaigning)	PUBL	1	1	0	0	1	0	0
e4	Policy-making and planning processes	PROC	1	0	1	0	1	1	0
e5	Judicial channels	JUDI	0	0	1	0	1	0	0
<i>Relations with others</i>									
f1	Long professional traditions	TRAD	0	1	0	0	0	0	1
f2	Co-operation	COOP	0	0	1	1	0	0	0
f3	Existence of environmental forestry organisations	ENFO	0	1	0	0	0	0	1
f4	Professional mixing in forestry organisations	MIXI	0	0	1	1	1	1	0
f5	Rise of counter movements to environmental protection	COUN	1	0	0	0	1	0	0

1C. POLICY ASPECTS

No.	Substance	Code	Fi	Fr	Mi	No	PN	Sw	WG
<i>Policy substance</i>									
G1	Functional dimension in land designation	FUNC	0	0	0	1	0	0	1
G2	Comprehensive environmental legislation	ENVI	1	1	0	1	0	1	1
G3	Level of forest protection	PROT	1	0	0	1	1	1	0
G4	Multiple goal forestry legislation	MULT	0	1	0	0	0	0	1
G5	Level of regulation in forestry as conflict issue	REGU	1	0	0	0	0	1	0
<i>Policy processes</i>									
h1	Major forest management legislative reform	REFO	1	0	1	0	0	1	0
h2	Revision of public ownership (e.g. participation)	PUBL	1	0	1	0	1	1	0
h3	Revision of economic instruments to secure environmental values in forests	INCE	1	0	0	1	0	1	1
h4	Major information and education programs for the forest sector	INFO	0	0	1	1	0	1	0
h5	Implementation of environmental norms or principles in forest management	IMPL	1	1	1	0	1	1	0
<i>Policy participants</i>									
i1	Party political interest	POLT	0	0	0	0	1	0	0
i2	Administrative co-operation	ADMI	1	0	1	0	0	1	0
i3	Involvement of multiple interest groups	INTR	1	0	1	1	1	1	0
i4	Involvement of the public (participation)	PUBL	1	0	1	0	1	0	0
i5	Involvement of the scientific community	SCIF	0	0	1	0	1	0	0

1D. ECONOMIC ASPECTS

No.	Substance	Code	Fi	Fr	Mi	No	PN	Sw	WG
<i>Economic environment</i>									
j1	Environmentally sensitive markets	ENVI	1	0	0	1	0	1	1
j2	Significant export markets	EXPO	1	0	0	1	0	1	0
j3	Dominant involvement of pulp and paper industry	PULP	1	0	1	1	0	1	0
j4	Forest industry involved as forest owner	INDU	1	0	1	1	1	1	0
j5	Existence of regionally important non-wood markets	NONW	0	1	1	0	0	0	0
<i>Economic processes</i>									
k1	Impact on wood markets (availability)	WOOD	1	0	0	0	1	0	0
k2	Dramatic changes in wood prices, judicial intervention	PRIC	0	0	1	0	1	0	0
k3	Impact on product markets, customer pressure	PROD	1	0	0	1	0	1	0
k4	Profitability problems in forestry	PROF	0	1	0	0	0	0	1
<i>Communication of economic values</i>									
l1	Image campaigning as joint forestry sector effort	IMAG	1	1	0	0	0	0	1
l2	Negative on-site eco-labelling, boycott threats, hot spots	HOTS	1	0	0	1	0	1	0
l3	Positive expectations of market benefits	EXPE	0	0	1	0	0	1	0
l4	Joint eco-labelling (certification efforts) initiatives and information production strategy	CERT	0	0	0	1	0	1	0

1E. RESOURCE ASPECTS

No.	Substance	Code	Fi	Fr	Mi	No	PN	Sw	WG
<i>Forest structure and management regime</i>									
m1	Large forest resource per inhabitant	RESO	1	0	1	1	1	1	0
m2	Existence of unprotected old-growth forests	OLDG	1	0	0	1	1	1	0
m3	Large share of forests totally protected	PROT	1	0	0	0	1	1	0
m4	Management of designated or special areas	PARK	0	1	0	1	0	0	1
m5	Traditional uneven-age management regime	UNEV	0	1	0	0	0	0	1
<i>Processes affecting forest use</i>									
n1	Increase in protection	PROT	1	0	0	1	1	1	0
n2	Revision of goals of public forestry in direction of environmental consideration	PUBL	1	0	1	0	1	0	0
n3	Visible changes in private forest management	PRIV	1	0	1	1	0	1	1
n4	Increase in harvest levels	HARV	0	0	1	0	1	0	0
<i>Forest users and use traditions</i>									
o1	Public rights, forest resource data	PUBL	1	0	0	1	0	1	0
o2	Commercial non-wood use	NONW	0	1	1	0	1	0	0
o3	Traditional forest use by indigenous people	INDI	0	0	1	0	1	1	0
o4	Community dependence on forest use	CMTY	1	0	0	0	1	0	0
o5	Pulp and paper dominated industry	INDU	1	0	1	1	0	1	0

1F. CONFLICT MANAGEMENT APPROACHES

No.	Substance	Code	Fi	Fr	Mi	No	PN	Sw	WG
<i>Substance management</i>									
p1	Authoritarian solutions (e.g. police, litigation)	AUTH	1	0	1	0	1	0	0
p2	Scientific resolution (e.g. data collection)	SCIF	0	0	1	0	1	0	0
p3	Normative changes (changing substance)	NORM	1	0	1	0	1	1	0
p4	Changes in practices (changing substance)	PRAC	1	0	1	1	0	1	1
p5	Information dissemination	INFO	1	1	0	0	0	0	1
<i>Processes management</i>									
q1	Use of conflict resolution committees	COMM	1	0	1	0	1	0	0
q2	Development of public participation	PART	1	0	1	0	1	0	0
q3	Interest group process	INTG	0	0	1	1	0	0	0
q4	Policy processes	POLI	1	0	1	0	0	1	0
q5	Development of certification system	CERT	0	0	0	1	0	1	0
<i>Relations management</i>									
r1	Arbitration	ARBI	0	0	1	0	1	0	0
r2	Dialogue	DIAL	0	0	1	1	0	1	1
r3	Co-operation	COOP	0	1	1	1	0	0	0
r4	Organisational integration / mixing	MIXI	0	0	1	1	1	1	0
r5	Education of forest professionals	EDUC	0	0	1	1	0	1	0

2. Tables of results for the empirical typology approach to QCA: grouping the cases.

2A. CONFLICT TYPES

No.	Statements (EXIST = ...)	Cases ¹⁾	Substance / Description	New categ. ²⁾
<i>A Conflict themes</i>				
A1	PROT*SOCI*mult*ROLE	Fi / PN	Social impacts of forest protection as the major conflict issue	INTE, (PUBL), (trad), (comm)
A2	harv*soci*MULT*role	Fr / No, Sw	Multiple use as dominant social aspect of conflict	(publ), (inte), (trad), (comm)
A3	prot*harv*soci*role	WG / Fr	Traditional forest management themes with little protection, social impact or public forestry debate	TRAD, (publ), (inte), (comm)
A4	prot*HARV*soci*MULT*ROLE	Mi	Harvest level, multiple use of forests and the role of public ownership as important conflict themes	COMM, (PUBL), (inte), (trad)
<i>B Conflict intensity</i>				
B1	PHYS*CAMP*mild	Fi / PN	Intense conflicts with frequent on-site protests and campaigning	INTE, (mild)
B2	phys*liti*mild	Fr, Sw / No	Little on-site protests or litigation	inte*mild
B3	phys*camp*MILD	WG / Mi	Mild discussion oriented conflicts with little on-site protests and campaigning	MILD, (inte)
<i>C Conflict actors</i>				
C1	EXTN*INDU*MEDI	Fi / No / PN / Sw	Media interest in the strong tension between external environmental pressure and industrial interests	OLDG, (trad), (comm)
C2	extn*indu*ADMI*dive	Fr / WG	Conflicts between administrations	TRAD, (oldg), (comm)
C3	extn*INDU*admi*medi*DIVE	Mi	Internal conflicts with diverse interests and little media interest involved	COMM, (oldg), (trad)

¹⁾ Comma between cases indicates that the cases are similar in respect of all categories. Slash between cases indicates that although the cases fall within the same group, they are not similar in respect of all categories.

²⁾ The new categories refer to categories built for subsequent hermeneutic Qualitative Comparative Analysis. These categories are presented in Appendix 2 and described in Section 4.3.2. Categories presented in parenthesis a so-called 'joint categories'. This means that joining at least two statements forms the category. Categories joined with '*' mean that they are combined with the logical operator 'and'. Accordingly, both conditions must be in force simultaneously.

2B. VALUE ASPECTS

No.	Statements (EXIST = ...)	Cases	Substance / Description	New categ.
<i>D Value dimensions</i>				
D1	frag*ECON*cmt*amen	Mi / No	Amenity values as an important aspect of the forestry debate	(clas)
D2	frag*cmt*priv*amen	WG / Sw	Little open clash of diverse values	(clas)
D3	FRAG*econ*CMTY*PRIV*AMEN	Fr, PN	Clash of heterogeneous environmentalism and socio-economic values within a setting of little economic importance	(CLAS)
D4	frag*ECON*CMTY*PRIV*amen	Fi	Clash of environmental and social values within as setting of strong economic importance	(CLAS)
<i>E Value communication</i>				
E1	dial*coop*PUBL*PROC	Fi / PN	Value communication towards the public with formal dialogue only	INTE, (CLAS), (avoi), (comm)
E2	dial*coop*PUBL*judi	Fi / Fr	Value communication towards the public with little co-operation and informal dialogue	(CLAS), (inte), (avoi), (comm)
E3	DIAL*coop*publ*judi	WG / Sw	Dialogue with little co-operation	(AVOI), (clas), (inte), (comm)
E4	DIAL*publ*proc*judi	WG / No	Dialogue through informal channels	(AVOI), (clas), (inte), (comm)
E5	DIAL*COOP*publ*PROC*JUDI	Mi	Direct value dialogue through multiple channels	COMM, (avoi), (clas), (inte)
<i>F Relations with others</i>				
F1	trad*coop*enfo*COUN	Fi / PN	Polarised relationships	INTE, (trad), (rela)
F2	TRAD*coop*ENFO*mixi*coun	WG / Fr	Separation in relationships	TRAD, (inte), (rela)
F3	trad*enfo*MIXI*coun	Mi, No / Sw	Non-traditional, mixed working relationships	RELA, (inte), (trad)

2C. POLICY ASPECTS

No.	Statements (EXIST = ...)	Cases	Substance / Description	New categ.
<i>G Policy substance</i>				
G1	ENVI*prot*MULT*regu	Fr / WG	Multiple goal forestry legislation without debate on protection or regulation level	TRAD, (chan), (resp)
G2	func*envi*mult*regu	Mi / PN	Disperse forest and environmental policies	CHAN, (trad), (resp)
G3	func*ENVI*PROT*mult*REGU	Fi, Sw	Protection and regulation level debated under wood production oriented policy	(RESP), (chan), (trad)
G4	FUNC*ENVI*PROT*mult*regu	No	Differentiated forest functions without dispute on level of regulation	(RESP), (chan), (trad)
<i>H Policy processes</i>				
H1	REFO*PUBL*INFO*IMPL	Mi / Sw	Multiple policy reforms	(REFO)
H2	REFO*PUBL*INCE*IMPL	Fi / Sw	Multiple policy reforms	(REFO)
H3	refo*ince*info*IMPL	Fr / PN	Implementation pressure on existing policies	(refo)
H4	refo*publ*INCE*impl	WG / No	Stable policies with incentive changes	(refo)
<i>I Policy participants</i>				
I1	polt*ADMI*INTR*scif	Fi / Sw	Multiple participants without party political tension or scientific debate	(REFO)
I2	polt*ADMI*INTR*PUBL	Fi / Mi	Multiple interest group and public participants without party political tension	(REFO), (PUBL)
I3	POLT*admi*INTR*PUBL*SCIF	PN	Political decisions based on scientific work in a setting of multiple actors	(PUBL), (refo)
I4	polt*admi*publ*scif	Fr, WG / No	Low scope of policy involvement	publ*refo

2D. ECONOMIC ASPECTS

No.	Statements (EXIST = ...)	Cases	Substance / Description	New categ.
<i>J Economic environment</i>				
J1	ENVI*EXPO*PULP*INDU*nonw	Fi, No, Sw	Environmentally sensitive export markets and dominant involvement of pulp and paper industry	RESP, (chan), (trad)
J2	envi*expo*pulp*INDU*nonw	PN	Non-environmental internal markets with strong involvement of local saw mills	(CHAN), (resp), (trad)
J3	envi*expo*PULP*INDU*NONW	Mi	Non-environmental internal markets with involvement of pulp and paper industry and non-wood industries	(CHAN), (resp), (trad)
J4	ENVI*expo*pulp*indu*nonw	WG	Internal environmental markets	(TRAD), (resp), (chan)
J5	envi*expo*pulp*indu*NONW	Fr	Internal non-environmental markets with involvement of non-wood products	(TRAD), (resp), (chan)
<i>K Economic processes</i>				
K1	pric*PROD*prof	Fi / No, Sw	Product market impacts under pressure from international NGO networks	RESP, (chan), (trad)
K2	PRIC*prod*prof	Mi / PN	Impacts on wood prices without external environmental market pressure	CHAN, (resp), (trad)
K3	wood*pric*prod*PROF	Fr / WG	Little market pressure for industry which is not involved as a forest owner	TRAD, (resp), (chan)
<i>L Communication of economic values</i>				
L1	imag*HOTS*CERT	No / Sw	Certification discussion under external pressure	MARK, (subs), (chan)
L2	IMAG*expe*cert	Fi / Fr, WG	Joint image campaigns without supporting monitoring systems (certification)	SUBS, (mark), (chan)
L3	imag*hots*cert	Mi / PN	Little market pressure or communication	CHAN, (mark), (subs)

2E. RESOURCE ASPECTS

No.	Statements (EXIST = ...)	Cases	Substance / Description	New categ.
<i>M Forest structure</i>				
M1	RESO*OLDG*unev*PROT*park	Fi, Sw, PN	Increased protection of old-growth forests as an issue	(OLDG), (trad), (comm)
M2	RESO*OLDG*unev*prot*PARK	No	Existence of old growth forests with emphasis on designated areas	(OLDG), (trad), (comm)
M3	reso*oldg*UNEV*prot*PARK	Fr, WG	Traditional variation in forest and park management regimes with no unprotected old-growth	TRAD, (oldg), (comm)
M4	RESO*oldg*unev*prot*park	Mi	Little protection or management issues	COMM, (oldg), (trad)
<i>N Processes affecting forest use</i>				
N1	PROT*PRIV*harv	Fi / No, Sw	Increased forest protection and changes in private forest management	RESP, (chan), (comm), (trad)
N2	PROT*PUBL*priv*HARV	PN	Major changes in protection, public forest management and level of utilisation	(CHAN), (resp), (comm), (trad)
N3	prot*PUBL*PRIV*HARV	Mi	Major changes in public and private forest management and level of utilisation	(CHAN), COMM, (resp), (trad)
N4	prot*publ*harv	Fr / WG	Little resource related changes	TRAD, (chan), (resp), (comm)
<i>O Forest use traditions</i>				
O1	PUBL*nonw*cmtY*INDU	No / Sw	Public rights with little specified non-wood or community rights	MARK, (OLDG), (resp), (rela), (comm), (chan)
O2	PUBL*nonw*indi*INDU	Fi / No	Public rights with little specified non-wood or indigenous rights	(OLDG), (resp), (comm), (chan)
O3	publ*indi*cmtY*indu	Fr / WG	Traditional forest management use traditions without public rights	TRAD, (mark), (oldg), (resp), (rela), (comm)
O4	publ*NONW*INDI*cmtY*INDU	Mi	Multiple non-wood use and indigenous traditions without public rights	COMM, (CHAN), (resp), (rela), (trad), (oldg)
O5	publ*NONW*INDI*CMTY*indu	PN	Multiple non-wood indigenous and community traditions without public rights	(CHAN), (comm), (resp), (rela), (trad), (OLDG)

2F. CONFLICT MANAGEMENT APPROACHES

No.	Statements (EXIST = ...)	Cases	Substance / Description	New categ.
<i>P Substance management</i>				
P1	auth*scie*PRAC*info	No, Sw	Internal changes rather than authoritarian influence	MARK, (RESP), (trad), (subs), (publ), (chan)
P2	auth*scie*norm*INFO	Fr, WG	Information dissemination outside the forest sector	TRAD, (resp), (SUBS), (publ), (chan), (mark)
P3	AUTH*scie*NORM*PRAC*INFO	Fi	Multiple aspect authoritarian influence and practical change	(PUBL), (trad), (SUBS), (PUBL), (chan), (mark)
P4	AUTH*SCIE*NORM*info	Mi, PN	Justification seeking authoritarian solutions	(PUBL), CHAN, (trad), (resp), (subs), (mark)
<i>Q Process management</i>				
Q1	COMT*PART*intg*cert	Fi / PN	Institutionalised conflict resolution (committees and participation)	INTE, (PUBL), (oldg), (mark), (trad)
Q2	COMT*PART*POLI*cert	Fi / Mi	Institutional and procedural conflict management	(PUBL), (REFO), (mark), (trad)
Q3	comt*part*intg*POLI*CERT	Sw	Use of policy and market processes in conflict resolution	(MARK), (inte), (OLDG), (trad), (REFO), (publ)
Q4	comt*part*INTG*poli*CERT	No	Use of interest groups and market processes in conflict resolution	(MARK), (publ), (inte), (trad), (refp), (OLDG)
Q5	comt*part*intg*poli*cert	Fr, WG	Non-procedural conflict resolution	TRAD, (inte), (mark), (publ), (oldg), (refo)
<i>R Relations management</i>				
R1	DIAL*COOP*MIXI*EDUC	Mi, No	Multi-faceted relations management	(RELA), (trad), (clas)
R2	arbi*DIAL*MIXI*EDUC	No, Sw	Multi-faceted relations management without arbitration	(RELA), (trad), (clas)
R3	arbi*coop*mixi*educ	Fi, WG	Little focus on relations management	TRAD, (rela), (clas)
R4	arbi*dial*mixi*educ	Fi, Fr	Little focus on relations management	(CLAS), (trad), (rela)
R5	ARBI*dial*coop*MIXI*educ	PN	Narrow institutional scope on relations management	(CLAS), (trad), (rela)

3. Truth table for the hermeneutic approach to QCA: comparing the cases.

No.	Substance	Characteristics	Code	Fi	Fr	Cases				
						Mi	No	PN	Sw	WG
<i>Categories used in the analysis</i>										
1	Intense conflicts		INTE	1	0	0	0	1	0	0
2	Constructive relationships		RELA	0	0	1	1	0	1	0
3	Substance oriented conflict management		SUBS	1	1	0	0	0	0	1
4	Change in policy and resource use		CHAN	0	0	1	0	1	0	0
5	Responsiveness to market pressure		RESP	1	0	0	1	0	1	0
6	Reformatory approach to policy		REFO	1	0	1	0	0	1	0
7	Stable policies in a traditional setting		TRAD	0	1	0	0	0	0	1
8	Public forestry in focus		PUBL	1	0	1	0	1	0	0
9	Avoidance of open value conflict		AVOI	0	0	0	1	0	1	1
10	Clash of environmental and community values		CLAS	1	1	0	0	1	0	0
<i>Additional categories excluded from the analysis</i>										
11	Communicative relations		COMM	0	0	1	0	0	0	0
12	Mild dialogic conflicts		MILD	0	0	1	1	0	0	1
13	Market communication		MARK	0	0	0	1	0	1	0
14	External pressure on old-growth forests		OLDG	1	0	0	1	1	1	0

4. Table of results for the hermeneutic approach to QCA: comparing the cases

No	Statements ¹⁾	a) Logical statements	Cases ²⁾	Statements ¹⁾	b) ... and their complements	Cases ²⁾
1	INTE ~	PUBL CLAS / CLAS trad / PUBL rela / rela trad	Fi, PN	inte ~	publ + clas	Fr, WG, No, Sw WG, No, Mi, Sw
2	RELA ~	clas subs / clas trad / subs inte / trad inte	Mi, No, Sw	rela ~	SUBS + CLAS + refo resp	Fi, Fr, WG Fi, Fr, PN Fr, WG, PN
3	SUBS ~	chan rela	Fi, Fr, WG	subs ~	refo trad + RELA / clas trad / trad inte + CHAN / PUBL resp / resp trad	No, PN Mi, No, Sw Mi, PN
4	CHAN ~	PUBL resp / PUBL subs / resp subs / resp trad / subs avoi	Mi, PN	chan ~	SUBS + RESP + publ	Fi, Fr, WG Fi, No, Sw Fr, WG, No, Sw
5	RESP ~	chan trad	Fi, No, Sw	resp ~	refo rela + CHAN / PUBL subs / subs avoi / avoi inte	Fr, WG, PN Mi, PN Fr, Mi
6	REFO ~	RESP / chan trad + RELA / clas subs / clas trad / subs inte / trad inte	Fi, Sw, (No) Mi, Sw, (No)	refo ~	rela resp + publ / chan inte	Fr, WG, PN Fr, WG, No, (Sw)
7	TRAD ~	publ SUBS / refo SUBS / resp SUBS / SUBS inte / publ rela / publ resp / chan resp / rela inte / chan refo rela / refo resp inte	Fr, WG	trad ~	RESP + REFO + PUBL + subs	Fi, No, Sw Fi, Mi, Sw Fi, Mi, PN Mi, No, Sw, PN
8	PUBL ~	trad avoi	Fi, Mi, PN	publ ~	chan inte	Fr, WG, No, Sw
9	AVOI ~	publ clas / chan clas	WG, No, Sw	avoi ~	CLAS + PUBL	Fi, Fr, PN Fi, Mi, PN
10	CLAS ~	rela avoi	Fi, Fr, PN	clas ~	AVOI + RELA / subs inte / trad inte	WG, No, Sw Mi, No, Sw

¹⁾ Although not specifically marked, all categories within a statement are joined with the logical operator 'and' which indicates the simultaneous existence of the characteristics described. Configurations or groups of configurations joined with '+' represent different aspects of the category analysed, and belong to the same solution. Configurations joined with '/' represent alternative solutions, from which one or more may be chosen as part of the larger solution, according to the example below:

– A*B*C + D*E*F + G*H*I = All configurations 'A*B*C', 'D*E*F', and 'G*H*I' are included in the result.
– A*B*C / D*E*F = Any one of the configurations 'A*B*C' or 'D*E*F' may be included in the result.

²⁾ Cases in parentheses are contradictory (see Section 4.1.3)