

# Role of Planners and Public Participation in Planning for Biodiversity

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### Abstract

The European Union (EU) is committed to conserving biodiversity, in terms of both natural and cultural legacies, and also to limiting biodiversity loss. Relevant policies have underlined the importance of considering ecological and social issues, as well as the complex relations between the two spheres in conservation of biodiversity. These policies have clear implications for all sectors responsible for planning for biodiversity conservation. In order to be consistent with international legislation, it is necessary to move beyond protected areas and include biodiversity conservation considerations in planning activities of various sectors, and also to involve relevant stakeholders in the planning process. This is in line with the landscape approach to planning that has recently been advocated in research and practical planning. The landscape approach has a holistic perspective that encompasses both ecological and social considerations.

This thesis focuses on the implementation of policies regarding biodiversity conservation and public participation; that is, the ecological and social dimensions of spatial planning in landscapes. In particular, I examine the role of people, such as planners implementing policies and other stakeholders who might influence biodiversity conservation. The studies within this thesis concern Poland and Sweden, and three sectors: regional, road and forestry planning.

The thesis is comprised of four papers. Paper I deals with planners working to implement biodiversity and public participation policies. Paper II concentrates on the issues of stakeholder involvement in the Environmental Impact Assessment of road planning. Paper III investigates a specific conflict that influenced the conservation of biodiversity in an important biodiversity hotspot. Paper IV is a conceptual paper that discusses the tools used to integrate ecological and social dimensions when implementing the European Landscape Convention.

The studies included in this thesis reveal that successfully implementing biodiversity conservation and public participation policies may require more than just ecological knowledge about how biodiversity should be maintained, and more than just formal guidelines regarding how the public should be treated in the planning process. In addition, the role of people who may influence the planning and decision making processes is crucial. Accordingly, there is a need for two key developments. Firstly, planners and the general public should be properly educated about conservation-related issues. Secondly, various incentives should be introduced that influence the behaviour and, in the longer term, the attitudes of the people who may affect biodiversity.

*Keywords:* biodiversity conservation, landscape, planners, policy implementation, public participation, spatial planning

## Planerares roll och allmänhetens deltagande i planering för biologisk mångfald

### Sammanfattning

Europeiska unionen (EU) har förbundet sig att bevara den biologiska mångfalden som är beroende av natur- och kulturarvet samt för att stoppa vidare utarmning. Relevanta policyområden understryker vikten av att beakta både ekologiska och sociala frågor i arbetet med biologisk mångfald. Detta får tydliga konsekvenser för alla sektorer som har ansvar för planering för bevarande av biologisk mångfald. För att följa internationell lagstiftning, finns det ett behov att utvidga perspektivet från skyddade områden att omfatta bevarande av biologisk mångfald i planeringsverksamhet i olika sektorer, liksom att involvera berörda aktörer i planeringsprocessen. Detta är i linje med den landskapssyn i planeringen som nyligen har förespråkats i forskning och i praktisk implementering.

I min avhandling fokuserar jag på hur policies för bevarande av biologisk mångfald tillämpas och hur allmänheten deltar i denna process. Framförallt tittar jag på den roll som människor, både planerare och andra aktörer, spelar i planeringsprocessen för bevarande av biologisk mångfald. Artiklarna i denna avhandling berör Polen och Sverige, och omfattar planeringsprocesser i regional-, väg- och skogsbruksplanering.

Artikel I behandlar planerare som arbetar med implementering av två policyområden nämligen det som handlar om bevarande av biologisk mångfald och det som berör samhällsdeltagande. Artikel II koncentrerar på aktörernas (både berörda myndigheters och allmänheten) deltagande i arbetet med miljökonsekvensbeskrivning i vägplanering. Artikel III analyserar en konflikt i ett område som är mycket viktigt för biologisk mångfald. Artikel IV är ett konceptuellt arbete som diskuterar ett verktyg för att integrera ekologiska och sociala dimensioner i genomförandet av den europeiska landskapskonventionen.

De studier som ingår i min avhandling visar att ett framgångsrikt genomförande av policies för bevarande av biologisk mångfald och för allmänhetens deltagande kan kräva mycket mer än enbart ekologisk kunskap om hur den biologiska mångfalden bör bevaras. Det behövs också mycket mer än de formella riktlinjer för hur allmänheten ska bemötas i planeringsprocessen. Människor påverkar planeringen och beslutsprocessen direkt eller indirekt. Hur planerare arbetar och hur allmänheten bemöts kan vara avgörande. Det finns därför ett behov av dels en genomgripande utbildning av planerare och av allmänheten om bevarande av biologisk mångfald, dels av att införa olika typer av incitament som kan påverka beteenden, samt dialog som på längre sikt kan förändra attityder hos människor med inflytande över den biologiska mångfalden.

Nyckelord: bevarande av biologisk mångfald, landskap, planerare, genomförandet av politiken, allmänhetens deltagande, fysisk planering

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*All kind of knowledge, eventually becomes self knowledge*  
Bruce Lee

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## List of Publications

This thesis is based on the work contained in the following papers, referred to by Roman numerals in the text:

- I Blicharska, M., Angelstam, P., Antonson, H., Elbakidze, M., Axelsson, R. Road, forestry and regional planners' work for biodiversity conservation and public participation: a case study of Poland's hotspots regions. *Journal of Environmental Planning and Management*. In press.
- II Blicharska, M., Isaksson, K., Richardson, T., Wu, C.-J. 2011. Context dependency and stakeholder involvement in EIA: the decisive role of practitioners. *Journal of Environmental Planning and Management*, 54, 337-354.
- III Blicharska, M., Angelstam, P. 2010. Conservation at risk: conflict analysis in the Białowieża Forest, a European biodiversity hotspot. *International Journal of Biodiversity Science, Ecosystems Services & Management*, 6 (1), 68-74.
- IV Mikusinski, G., Blicharska, M., Antonson, H., Henningsson, M., Göransson, G., Angelstam, P., Seiler, A. Integrating ecological, social and cultural dimensions in the implementation of the Landscape Convention. *Landscape Research*. In press.

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The contribution of Malgorzata Blicharska to the papers included in this thesis was as follows:

I 75 %

II 40 %

III 85 %

IV 25 %

My PhD thesis is a continuation of the work I conducted for my licentiate thesis, which I defended in March 2009, entitled: “Planning processes for transport and ecological infrastructures in Poland – actors’ attitudes and conflict”. However, the main topic has shifted slightly towards a more comprehensive understanding of the role of people in planning processes.

The funding for the thesis was derived from several different sources, i.e. diverse projects with quite different focus. The common theme, however, was the role of people in planning for biodiversity conservation in landscapes as social-ecological systems.

## Abbreviations

BNP	Białowieża National Park
CAB	County Administrative Board
CORINE	Coordination of Information on the Environment
EC	European Commission
EEC	European Economic Community
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EPA	Environmental Protection Agency (in Sweden)
EU	European Union
FA	Forest Agency (in Sweden)
GIS	Geographical Information Systems
GSD	Geografiska Sverige Data
IMFN	International Model Forest Network
IUCN	International Union for Conservation of Nature
NGO	Non-governmental organisation
PFC	Promotional Forest Complex
PME	Polish Ministry of Environment
PNRA	Polish National Road Authority
PP	Public participation
RBSP	Regional Bureau of Spatial Planning (in Poland)
SF	State Forest (National Forest Holding) (in Poland)
SNRA	Swedish National Road Administration
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WCED	World Commission on Environment and Development

# 1 Introduction

Conservation of biodiversity is an important contemporary issue on global, EU and national policy agendas. The European legal framework is based on two main directives: Habitat and Birds Directives (EEC 1979, EEC 1992), accompanied by Water Framework Directive (EC 2000). Other policy documents influencing conservation issues in Europe are the European Landscape Convention (ELC) (Council of Europe 2000a) and the globally accepted Convention on Biological Diversity (UN 1992). These policies put in focus a long-term maintenance of biodiversity, which requires a combination of both coarse- and fine-scale conservation strategies. In the face of on-going economic development in the European countries the main question is how to maintain biodiversity, without compromising the needs of people. Therefore the international policies regarding biodiversity conservation in particular and the environment in general, underline the need to include the general public's opinion in planning and in decision making (UN 1992, UNECE 1998, EC 2000).

The policies have thus clear implications for all sectors which spatial planning work may have consequences for biodiversity conservation. To be consistent with international legislation, relevant sectors need to include biodiversity conservation considerations in their planning activities and involve relevant stakeholders in their decision making process. This is consistent with landscape approach to planning that has recently been advocated in both research and practical planning, as a holistic perspective encompassing both ecological and social considerations, at the scale of landscapes (Tress et al. 2006, Singer 2007).

According to the landscape approach landscapes are social-ecological systems where natural and social systems are intermingled (Berkes and Folke 2000, Berkes et al. 2003), and therefore cannot be viewed as separate entities. It reflects the need to expand the spatial scale of planning, moving from smaller units or objects to the extents of landscapes and regions, embracing the multiple levels of governance (Tress et al. 2006). This approach is also reflected by the ELC, which describes landscape as an area, perceived by people, evolving through time due to both natural forces and human factors (Council of Europe 2000a), and by different practical initiatives on the ground (Axelsson et al. 2008). Landscape approach also reflects the new thinking about the conservation, which transcends biology and includes social science disciplines in biodiversity conservation science (Roberge et al. 2010).

People play an important role in biodiversity conservation, in a variety of ways (e.g. Gadgil et al. 1993, Cincotta et al. 2000, Savard et al. 2000, Miller and Hobbs 2002, Foley et al. 2005). In my thesis I focus on two main issues related to people and biodiversity: the role of planners and the participation of public in conservation. First, actors in different sectors and at various levels affect biodiversity through their spatial planning activities, i.e. shaping and managing places (Roberts 2009). The role of planners has been seen as an important contextual issue that influence environmental decision-making and on-the-ground practice (e.g. Patel 2006, Petts and Brooks 2006, Nykvist and Nilsson 2009). Planners are also often the ones who are responsible for organisation of public participation process in relation to their planning activities and decision making. Thus they may considerably influence how the participation of public looks like (Tooke 2003, Blicharska et al. 2011). Second, the success of biodiversity conservation is dependent on broad

public support (Miller and Hobbs 2002). Public participation may improve the legitimacy, accountability and transparency of the planning process, and thus decrease the risk of conflicts (Young et al. 2005, Isaksson et al. 2009), notwithstanding some difficulties and dilemmas connected to public involvement (e.g. Tweddr-Jones and Allmendinger 1998, Connelly and Richardson 2004, Lezaun and Soneryd 2007). Consequently, implementation of policies on biodiversity conservation and on public participation is to a large degree directly dependent on the implementing actors (deLeon and deLeon 2002), i.e. planners and decision makers, and, indirectly, on the general public (Adams and Hutton 2007).

Conservation of biodiversity is a very broad field that has been of interest of diverse disciplines, including both natural and social sciences (Büsher 2008, Roberge et al. 2010). The issues studied range from ecological and biological considerations (e.g. Dobson et al. 1997, Rodrigues et al. 2004), through planning and policy implementation theories (e.g. Lämås and Fries 1995, Mattison and Norris 2005), to the environmental psychology considerations of the role of people in conservation (e.g. Gardner and Stern 2002). Moreover, there are various integrative approaches to conservation research, not only combining different disciplines, but also including actors outside academia (Fry et al. 2007). In spite of this broad scientific interest and large efforts of practitioners, the successful management of biodiversity is still limited (Rands et al. 2010, Stockstad 2010) and there is a need for more research concerning practical implementation of conservation policies.

In my thesis I focus on the implementation of policies regarding biodiversity conservation and public participation, i.e. both ecological and social dimensions of planning in space, as reflected by the landscape approach. I particularly look into the role of people –planners in different sectors implementing policies and other stakeholders that may influence conservation planning – to discuss their possible impact on the conservation of biodiversity. Even if the four papers included in my thesis are of different character and deal with diverse issues, the main concepts around which I arrange my thoughts are spatial planning, biodiversity conservation, landscape as social-ecological system and participation of public, i.e. the concepts being central for the successful implementation of biodiversity policies.

Paper I focuses on planners working with the implementation of biodiversity and public participation policies in order to answer the question how planners from three sectors in Eastern Poland handled these issues in their planning work. Paper II concentrates on the issues of stakeholder involvement (participation of both relevant authorities and the general public) in Environmental Impact Assessment (EIA) of road planning in Poland and Sweden. Paper III investigates a specific conflict that influenced conservation of biodiversity in an important biodiversity hotspot in Poland. Paper IV is a conceptual paper discussing tools for integrating ecological and social dimensions in the implementation of the European Landscape Convention. Further descriptions about particular papers will follow later on.

I have chosen to focus on two countries: Poland and Sweden. Poland, that joined the EU in 2004 have maintained rich biodiversity due to less developed economy and less intensive landscape use in comparison to western Europe (e.g. Plut 2000, Urbanc et al. 2004), especially along its eastern border. By entering the EU, Poland has accepted a number of international policies aiming at securing biodiversity, and agreed to both incorporate them into national policies and implement in practice. After entering the EU, Poland's economic development has accelerated and human activities presently threaten the country's biodiversity (e.g. Young et al. 2007, Keshkamat et al. 2009). In this context, the extent to which Polish planners are able to cope with biodiversity conservation in efficient way is highly relevant. On the other hand, Sweden has been economically much more developed and with strong bonds with EU under much longer period. It is often perceived as a pioneer nation when it comes to both environmental management and stakeholder involvement (e.g. Eckerberg 2001, Bradley 2009) and as such it is an interesting case to be compared with a country with other legacy of development, namely Poland.

## 2 Theoretical background

### 2.1 Spatial planning

Spatial planning resides at the interface between the natural and the social system. By spatial planning stakeholders (individuals, groups or organisations) organise the biophysical landscape in space and time, with the aim to reach agreed goals (e.g. biodiversity conservation, urban development, road building goals, etc.). However, conventionally, the focus of spatial planning is thematically and spatially narrow whereby decisions are involved only within a particular sphere of interests of particular agencies within individual sectors (Cullingworth and Nadin 2006, Fürst et al. 2010). Of course, there are different strategic documents and policies that encompass large scale consideration, however, actual decisions on what is located in space are often taken within particular sectors. However, because landscapes' natural and social values are interrelated to social institutions, legal systems, and individuals at different organisation levels and spatial scales, it is important that sectors co-operate, and in many cases go behind traditional administrative borders (Angelstam et al. 2003, Roux et al. 2008). Biodiversity conservation is a particular sphere of planning that requires such co-operation and an approach combining multiple scales (see the section about biodiversity below).

Generally, the term “planning” can be used to denote different meanings. It can be about, for example, strategic or operational planning for a company, or planning of annual activities of an organisation, etc. However, my thesis is about planning of activities, management, or physical investments in space, i.e. spatial planning. Planning of space is a research focus of the discipline called planning theory. According to Campbell and Fainstein (2005) the central question of the planning theory is: “What role can a planning play in developing the good city and region within the constraints of a capitalist political economy and democratic political system?” This question can also be considered as a definition of planning, as “set of activities that aim at developing *good* city or region” (Cambell and Fainstain 2005). This definition is a very broad one, and as such may include many different activities. As Campbell and Fainstein (2005) claim, planners not only “plan”, but also negotiate, forecast, research, survey and organise financing. The definition given by the ELC also underlines the complexity of planning process. According to the ELC, planning means “strong forward-looking action to enhance, restore or create landscapes” (Council of Europe 2000a), which may include the “formal process of study, design and construction by which new landscapes are created to meet the aspirations of the people concerned” (Council of Europe 2000b).

My thesis is about planning and decision making in relation to biodiversity conservation, taking into account people – both the general public and the planners. Thus I will use the term “planning” as an activity that shapes landscapes treated as social-ecological systems (see the section about landscape approach below) to fulfil particular objectives, i.e. in my thesis – effective conservation of biodiversity. That is, planning both in terms of actual “spatial planning”, i.e. making spatial plans, and in terms of taking decisions concerning the plans. Thus I will use the term “planners” for both the actual people making plans and the ones that take key decisions concerning these plans.

## 2.2 Biodiversity and its conservation

Noss (1990) defines biodiversity (or biological diversity) as composition, structure and function of ecosystems. Composition concerns species, populations, communities and ecosystems in a particular region; structure refers to how these different elements are physically organised in the environment; while the functional component is about the underlying ecological processes that sustain the composition and structure (Walker 1992).

The Convention on Biological Diversity (UN 1992) complements the above mentioned definition by adding also genetic diversity and diversity of ecosystems as components of biodiversity:

Biological diversity means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (UN 1992).

Extremely high species extinction rates described for taxonomically diverse groups and widely different environments (e.g. Pimm et al. 1995), have helped to recognise that Earth is facing biodiversity crisis. Biodiversity conservation has therefore been recognised as an important global issue, and there is a general agreement that humans have responsibility to maintain its diverse values for future generations. Recommendations for biodiversity conservation focus on necessity to conserve dynamic, multi-scale ecological patterns and processes that sustain the full complement of biota (including species) and their supporting natural systems (e.g. Poiani et al. 2000). However this is a very difficult task in the face of growing demands of the human population, and the decline of biodiversity continues in both global and regional scales (e.g. Sanderson et al. 2006, Stockstad 2010). Social costs of conserving biodiversity are often very high both in the case of securing the entire ecosystems (e.g. Frazee et al. 2002) or protecting particular species (Main et al. 1999, Mikusinski et al. 2010). Since costs of biodiversity conservation often compete with necessary needs of human societies, the effective conservation planning is one of the key components needed to halt the biodiversity loss (Margules and Pressey 2000).

Conservation planning may occur at multiple scales ranging from particular forest stands, meadows or ponds with threatened organisms (Poiani et al. 2000), through landscape and regional level planning (e.g. Marris 2011) to continental or global planning activities (e.g. Blicharska and Mikusinski 2011). How to distribute various conservation measures, both active and passive, in space and in time are basic components of conservation planning practice. Therefore, the conservation planning, landscape planning and spatial planning are largely overlapping activities, what is especially evident in densely populated areas (Miller and Hobbs 2002).

Biodiversity conservation in Europe is concentrated on remnants of natural ecosystems (e.g. old-growth forest) and on pre-industrial cultural landscapes that during centuries developed unique and species-rich communities linked to ancient management (e.g. hay meadows or pastures) (DeLong 1996, Peterken 1996, Agnoletti 2006). Intensive forest management and intensification of agriculture have been major causes of biodiversity decline in the above environments (Matson et al. 1997, Tilman 1999, Betts et al. 2005, Junninen et al. 2006). Today, a large number of threatened species are linked to forest habitats (Larsson et al. 2001, Djupström et al. 2010). Moreover, several ecological processes crucial for biodiversity occur in naturally dynamic forests (Larsson et al. 2001, Nordlind and Östlund 2003, Müller et al. 2008). For many area demanding species forests and woodlands must form sufficient networks of habitats to be functional (Mikusinski and Edenius 2006). Also, species that are dependent on structures that are decreasing due to modern forestry (e.g. dead wood or old trees) are being threatened or locally extinct (e.g. Mikusiński and Angelstam 1998). Biodiversity occurring in cultural landscapes is related to traditional farmer's activities (Agnoletti 2006), which are presently disappearing due to economic intensification (Jongman 2002,

Angelstam 2006). Therefore, cultural landscapes in European countries in transition to market economy are particularly important for the conservation of biodiversity (e.g. Pimentel et al. 1992, Birol et al. 2006). In addition to forestry and agriculture, the transport infrastructure and housing development are additional threats to biodiversity (Cervigni 2001, Sandström et al. 2006a).

Loss of biodiversity in European landscapes due to processes mentioned above has been recognised by politicians. The issue is, for example, reflected in the Pan-European forest policy process (Rametsteiner and Mayer 2004) and in the EU Forest Action Plan (Biro et al. 2005) that emphasize the need for long-term maintenance of biodiversity that should be balanced with the economic development. Also maintenance of cultural landscapes is underlined by policies, such as the Convention on Biological Diversity or ELC.

One important precondition for the maintenance of biodiversity is functional connectivity of representative habitats or land cover types at the scale of landscapes or regions. Functional connectivity of habitats is a prerequisite for safeguarding specialized and area-demanding species (e.g. Carroll et al. 2001, Mikusiński and Edenius 2006, Gillies et al. 2008), indeed a challenging key component of biodiversity conservation (see more about landscape connectivity in a section below). Thus, to maintain biodiversity as stated in international policies, professionals dealing with conservation planning should not concentrate only on the local scale, but they should have wider spatial perspective of large geographical landscapes. An example of the local scale considerations for biodiversity (lowest ambition level) is the idea of smaller protected areas, e.g. nature reserves, encompassing remnants of natural habitats and protecting species only locally. On the other hand, the highest level of ambition could be represented by a comprehensive landscape planning at the regional level, where different sectors co-operate to secure survival of whole ecosystems in long-term (e.g. Mikusiński et al. 2007).

The knowledge on what is important for long-term maintenance of biodiversity was essential in elaborating the normative model against which I evaluated how planners implemented biodiversity conservation policies in eastern Poland (Paper I).

### 2.3 Landscape approach

The definition of landscape according to European Landscape Convention is:

Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors (Council of Europe 2000a).

This definition illustrates that the landscape is one entity, in which natural and social-cultural components should be considered together in planning (Council of Europe 2000a). Natural components include, for example, particular species or habitats, natural resources, geological formations, whole naturally valuable areas, ecosystem services, biodiversity, and so on. Social-cultural components can also be very diverse and may encompass both “tangible” components, for example, cultural heritage monuments, and intangible, perceived components, such as, for instance, places of individual memory or other particular interest (Antonson 2011). All these components interact in space and time, at multiple levels.

The concept of landscape approach to planning originates from the field of nature conservation, and from the increasing understanding of the need to involve people, and in general social issues, in planning that aims at different dimensions of sustainability (Singer 2007). The main idea of the landscape approach is to treat landscapes as social-ecological systems and consider multiple levels of governance in planning. The landscape approach is presently a well-established concept that affects both research (Dudley et al. 2006, Törnblom 2008, Tress et al. 2006) and policies at different levels (Singer 2007, World Forestry Congress 2009). Moreover, various initiatives that are more or less consistent with the ideas of landscape approach have been created. Examples are Model Forest (IMFN 2008), EU Leader (Moseley 2003, Bryden

and Hart 2004), UNESCO's Biosphere Reserve (Bridgewater 2002), or Polish Promotional Forest Complex (Rykowski 1997).

In line with the landscape approach, people are crucial element of the planning processes in landscapes that directly or indirectly aim at biodiversity conservation. Thus, in Papers I and II, I investigate how the planners implement policies and plans regarding biodiversity and public participation; and in Paper III, I investigate a biodiversity related conflict to exemplify how the public can influence biodiversity conservation in a hotspot area.

In line with the landscape approach, in Paper IV, I look into possibilities of finding tools to include both ecological and human dimensions in planning. The main idea is to use the concept of connectivity derived from ecology in relation to human-related values.

The concept of connectivity is used in ecology to characterise a landscape from the perspective of organisms and their spatial needs, and to deal with the problems of habitat loss and fragmentation, that are major causes of biodiversity decline (Taylor et al. 1993). The notion of ecological connectivity refers to the functional relationship among habitat patches and the movement responses of organisms to the landscape structure (With et al. 1997). It may be defined as the degree to which the landscape facilitates or impedes organisms' movement among resource patches (Taylor et al. 1993). It is not possible to measure an overall landscape connectivity (Kindlmann and Burel 2008). One can only aim at analysing the landscape connectivity with regard to particular species or habitat features with respect to a specific management problem (e.g. Pascual-Hortal and Saura 2008).

The concept of connectivity can also be applicable to humans, as they move across the landscape in relation to their everyday activities, in order to access resources like living, working or recreational spaces (e.g. Perry 1995, Hayden 2002). High connectivity from the human perspective means thus a good access to necessary resources. Infrastructure developments and the changes in human needs, as well as in the distribution of resources are changing, and therefore the level of connectivity differs with time. Thus, connectivity may be considered both in terms of present human needs, and in terms of "historical connections that still remain" (Antonson et al. 2010). The knowledge concerning the historical connectivity including the distribution of various landscape elements influencing this connectivity may be perceived as ancient landscape linkages worthy to be acknowledged, and if essential, preserved as part of the cultural heritage.

## 2.4 Public participation and deliberation

Participation is a broad concept, embracing several forms of public involvement. Arnstein's frequently cited "ladder of citizen participation" presents different "steps" of participation ranging from information to citizen control (Arnstein 1969). In information emphasis is placed on a one-way flow of information – from officials to citizens – with no possibilities for feedback and no power for citizens to negotiate. The next step of the ladder is consultation, where citizens' opinions are invited. However, consultation is only the first step towards full participation, as "it offers no assurance that citizen concerns and ideas will be taken into account" (Arnstein 1969), especially in the situation of unbalanced power. The next steps of the participation ladder: placation, partnership, delegated power and finally citizen control are characterised by the increasing influence and power of the citizens.

Arnstein's ladder is a classical representation of the degrees of participation. However, for the analysis in my studies (Papers I and II), I applied the concept of deliberation which is a concept that appears as a more specific and precise. This concept has been launched within democracy theory during the last decades (Dryzek 2000), and has been central in much of the policy and planning literature during the last 15 years (Innes 1995, Forester 1999, Healey 2007). Deliberation refers to communication and decision-making through argument and dialogue, echoing the Habermasian idea of communicative rationality (Habermas

1984) and ideas of the communicative or collaborative model of planning in planning theory (Fainstein 2000). A deliberative process is a social process where deliberators “are amenable to changing their judgements, preferences, and views during the course of their interactions, which involve persuasion rather than coercion, manipulation, or deception” (Dryzek 2000).

Hajer and Versteeg conceptualised deliberation as a specific quality of dialogue, and point to five dimensions, which they identify as important requirements of a deliberative process (Hajer and Versteeg 2005): 1) being open, 2) being accountable, 3) being reciprocal, 4) being integer; and 5) involving learning through iterative dialogue. Briefly, openness is about having a process where everyone who wants to participate can do so. Accountability is about having a transparent procedure where it is clear who is answerable and responsible for a decision. Reciprocity means, simply, a two way dialogue, and “being integer” suggests that it should be respectful and involve speaking in turn as well as everybody listening to each other. Learning can be explained by referring to Lezaun and Soneryd’s statement that one important quality of deliberation is the movement of participants, topics and opinions (Lezaun and Soneryd 2006). The ideal of deliberation was used both in Paper I and II to describe characteristics of a “good” process of participation.

## 3 Methodology and methods

### 3.1 Methodological assumptions

In his book “InterViews: an introduction to quantitative research interviewing” from 1996 Steinar Kvale presents two metaphors of knowledge, illustrating the shift in the philosophy of knowledge. In the metaphor of the miner, Kvale illustrates knowledge as something that is “given”, that exists independently on the observer and can be “found” by the researcher. Such a view of knowledge has for a long time permeated traditional social sciences. The metaphor of the traveller presents a researcher conducting qualitative interviews as a “traveller on a journey that leads to a tale to be told upon returning home”, exploring many domains of the country, and reflects the “new” meaning of knowledge, as something that is constructed and may be based on the multitude of subjective views.

The post-modern schools of thought criticises the conception of knowledge as a “mirror of reality”, and focuses on the reality that does not exist objectively, but is socially constructed and context dependent (Flyvbjerg 2001, Watson 2003). Consequently, knowledge gained through the research interviews is also being constructed during the interview situation. Such knowledge is dependent on the interviewer who structures the interview according to his/her pre-assumed framework of thinking. Thus, in my thesis I see knowledge as something that can be represented from different points of view (of different interviewees) and can be interpreted in relation to pre-assumed theoretical frameworks.

Papers I and II can be located within policy implementation research concerning biodiversity conservation and environmental impact assessment. Policy implementation research is about what develops between the establishment of an apparent intention to do something according to an agreed policy, or to stop doing something, and the ultimate impact in the world of action (O’Toole Jr. 2000). While some scholars such as Mazmanian and Sabatier (1989) include both the assembly of policy actors and action, as well as the cause-effect relationship between their efforts and ultimate outcomes, others focus on either (1) policy process, (2) outputs (e.g. a planning process) or (3) the consequences the process has for the issue at hand (e.g. biodiversity conservation in terms of population viability) (see Rauschmayer et al. 2009a). The two papers focus on the planning process and, particularly, on planners’ activities and their role in the planning process, through which they implement particular policies or plans. This is in line with a top-down approach to policy analysis, proposed by many scholars (for review see Sabatier 1986), as it starts with the implemented policies and the institutions that implement them. However, my approach has also elements of the bottom-up approach to policy analysis (Hjern 1982, deLeon and deLeon 2002), as it focuses not on the legal structures and formal steering for implementation but rather on the knowledge, abilities and willingness of the lower lever implementing actors (i.e. planners in different sectors).

For Paper II, the overall analytical approach was additionally inspired by theories stating that there is a need to examine both structural aspects, such as formal procedures for decision-making, as well as the way in which stakeholders interact socially within formal institutional settings to fully understand the complex

dynamics that occur within, for example, planning institutions (e.g. Healey 2007). Therefore, both relevant documents and the perspectives of planners were examined.

### 3.2 Data collection

Interview is a key method of qualitative research methodology. I primarily used semi-structured in-depth interviews (Papers I, II, III). Technically a semi-structured interview is like an open conversation, but based on an interview guide focusing on certain themes (Kvale 1996). An open in-depth interview is less structured and more like a very open conversation around the issues of concern (Kvale 1996). In addition to interviews, I used qualitative content analysis of documents (Paper II).

Before preparing the interview manual and conducting interviews, as well as preparing the survey questions for each of the studies, the relevant literature and/or policy documents were reviewed to gain knowledge about the general context of the particular study case. Relevant literature and policy documents were also reviewed to create a normative model in Paper I.

In Paper I, 16 semi-structured interviews with planners from three sectors, regional, road and forestry planning, were carried out in the Podlaskie and Podkarpackie regions (Figure 1) in 2008. An interview manual was used during the interviews (see appendix in Paper I), however many *ad-hoc* questions were also asked, when necessary, to investigate particular issues in depth. The interviewees were chosen to represent all three planning sectors (regional planning, road planning and forestry). Depending on the planning unit and sector, there were different numbers of planners directly involved in the issues of concern for this study.

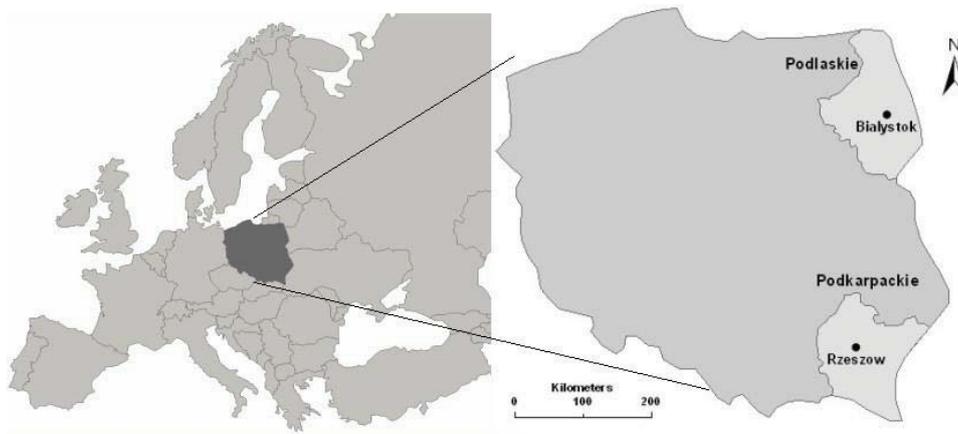
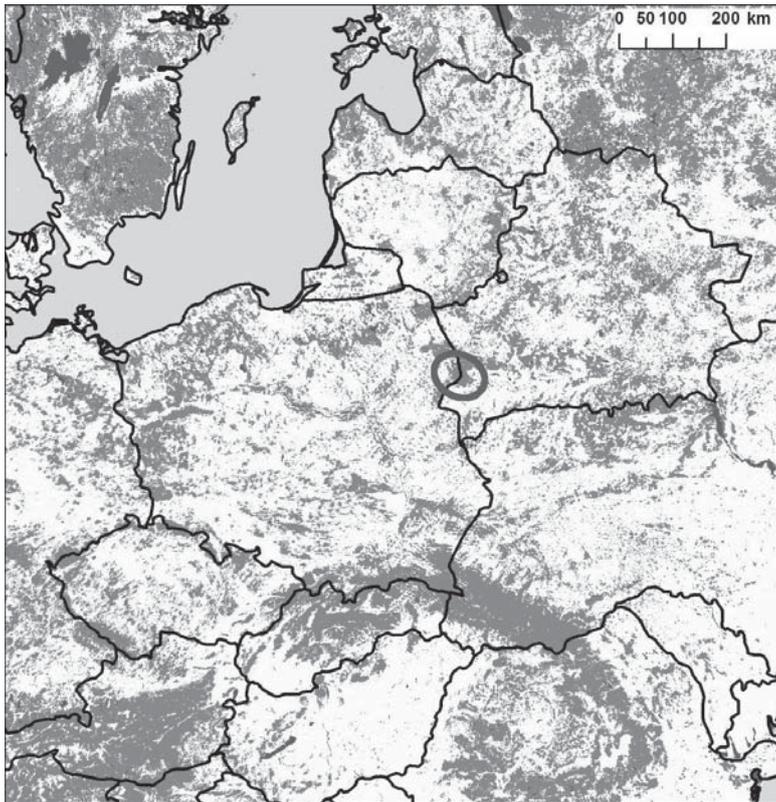


Figure 1. Location of the Podlaskie and Podkarpackie Regions and their capitals in Poland and location of Poland in Europe.

Data collection for the study presented in Paper II was based on both review of relevant documents, mainly legal acts and practitioners' manuals, and on semi-structured interviews with road planners, external EIA consultants, environmental specialists and public communication experts of the road authorities (see appendix in Paper II). In total 15 interviews were conducted in 2007 and 2008, seven in Sweden and eight in Poland. The interviewees were chosen to represent the perspective of the practitioners (i.e. road planners) in several different road planning regions in both countries.

In Paper III semi-structured interviews were conducted with 14 key stakeholders in the Białowieża Forest region in North-eastern Poland (Figure 2) in spring 2006 to gain specific knowledge on the conflict over the Białowieża Forest. Stakeholders were divided into four groups representing (1) forest management districts, i.e. foresters (two interviewees), (2) municipality administrative boards, i.e. municipalities (five), (3) the Białowieża National Park (BNP) administration (two), and (4) scientists and environmentalists working in the region (five). In autumn 2008 I conducted two additional open interviews, one with a forest management district representative, and one with an environmentalist, to learn about recent developments of the Białowieża Forest case.



*Figure 2.* Location of the Białowieża Forest. The forest is located on the border between Poland and Belarus, but Paper III concerns only the Polish part.

Paper IV is a conceptual paper discussing and exemplifying potential use of GIS (Geographical Information Systems) in broadening the scope of spatial planning. The data for analysing ecological connectivity, namely the information on the distribution of deciduous forest and grasslands in the study area, was the Swedish CORINE Land Cover Data (GSD-Marktäckedata), obtained from the Swedish Land Surveying Authority ([www.lantmateriet.se](http://www.lantmateriet.se)). For visualisation of the present human movements data from 84 questionnaires answered by people living in the study area, that was a part of a larger study (Henningsson et al. unpubl.) carried out in 2008, was used. The respondents were asked to mark on a map the location of their houses, and which places were visited, for what purpose, how often, and what road

they used to get there. To present cultural heritage connectivity so called a “stomkarta” was used. “Stomkarta” is a groundwork produced in the mid19<sup>th</sup> century for the ordnance survey map (Jansson 1993).

### 3.3 Data analysis

The framework of analysis in the Paper I, i.e. an understanding-ability to act-will to act approach, was inspired by a framework for policy implementation studies of Mazmanian and Sabatier (1981). Similar approach has been, for example, used by Sandström et al. (2006b) and Wärnback and Hilding-Rydevik (2009) in the investigation of urban biodiversity planning, and implementation of impact assessment legislation in Sweden, respectively. To investigate in what way biodiversity conservation and public participation were handled in the three chosen planning processes, I created a normative model for how planners should ideally act to implement policies (Figure 3) which the data from the interviews were compared to.

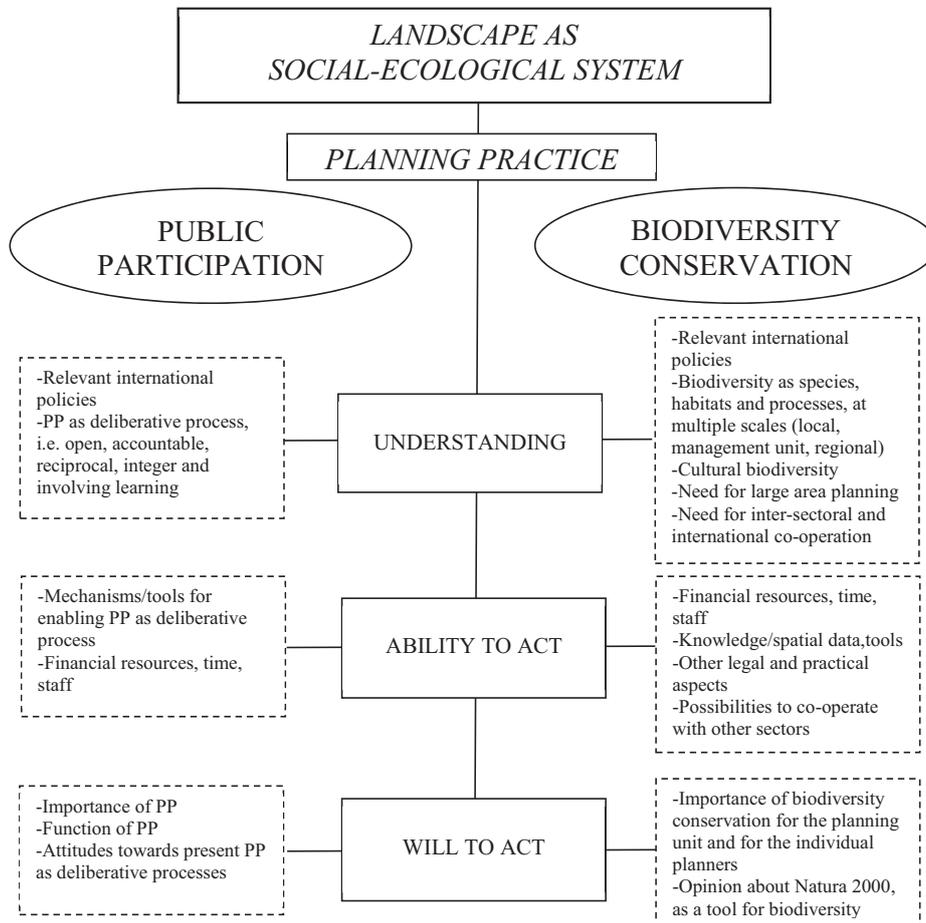


Figure 3. Normative model from Paper I of how planners should ideally handle biodiversity conservation and public participation (PP).

According to this model three prerequisites need to be realised for effective implementation of policies concerning biodiversity and public participation in the planners' work: 1) planners need to understand what biodiversity conservation and public participation are about (and this knowledge can be derived from the existing policies on these issues); 2) they need to have essential resources, in terms of money, staff, data, tools, etc., and 3) planners need to have the will to work with biodiversity conservation and public participation in their regular planning work.

In relation to biodiversity conservation, international policies point to a need to create a functional network of habitats to enable maintenance of species in long-term (EEC 1979, EEC 1992). Thus, in the normative model used in Paper I, effective maintenance of biodiversity needs to secure viable populations of species, supported by a functional network of habitats of sufficient quality (Hanski 1998, Fahrig 2003). To achieve that, planners have to understand the necessity of taking into account not only particular species, but also their habitats and ecological processes (Noss 1990) at multiple spatial scales (Angelstam et al. 2003). Consequently, planning for biodiversity should not only concentrate on protected areas but be included in every-day planning activities of different sectors (Geneletti 2003, 2008, Atley and Morad 2009). Additionally, planners from different sectors should co-operate. This means that planning should be a comprehensive activity that covers entire landscapes and regions, ensuring well-developed communication and cooperation among sectors, and internationally as well (Bridgewater and Cresswell 1998). Moreover, planners should consider cultural biodiversity in their work, as traditional land use practices have contributed to the contemporary conservation values (Agnoletti 2006).

With regard to public participation, international policies underline the need to take into account local knowledge in decision making concerning environmental issues and stress the need for accountability and transparency of planning processes that can be strengthened through that (UN 1992, UNECE 1998, EC 2000). The policies advocate participation open to all interested stakeholders and recognise the importance of public learning. This is close to the concept of deliberation (Forester 1999, Innes and Booher 200, Hajer and Versteeg 2005), often used in assessment of stakeholder involvement (e.g. Petts 2000, Isaksson et al. 2009, Blicharska et al. 2011). Thus, the normative model assumes that good public participation means a process open to all stakeholders, which is accountable, reciprocal, integer, and involves learning through iterative dialogue (Hajer and Versteeg 2005) (for more explanation see section "Public participation and deliberation" above).

The analysis in Paper II is based on framework consisting of five key requirements for a deliberative process (Hajer and Versteeg 2005), as described above in the analysis framework for the Paper I and in the theoretical background section.

The data in Papers I and II were analysed using a qualitative content analysis approach (Bryman and Teevan 2005). During the analysis, I searched the interview material for relevant categories, i.e. prerequisites for successful biodiversity conservation (Paper I) and good participation (Papers I and II) according to the normative model described above. After coding the interview material into relevant categories, the information obtained from particular planners was compared across particular categories both within and between sectors (Paper I) and between countries (Paper II). However, in Paper I, I had no explicit ambition to compare different sectors, but simply describe their work for conservation and PP. Nevertheless, in some cases, obvious differences between sectors are visible. Paper II aimed at investigating, first, how the common EU legal background was translated into the institutional shape of decision-making processes, i.e. the relevant policies and guidance distributed to the planners, such as planning handbooks, in both Poland and Sweden. Second, these results were contrasted with how the practical implementation of these policies and guidance was actually conducted by planners, based on the reflections of planners on their own work.

For the analysis in Paper III I employed the Grounded Theory approach (Glaser and Strauss 2008) – an approach to sociological research and a framework for dealing with qualitative data. Glaser and Strauss (2008) describe theoretical sampling as a method of combining data collection with its analysis (Strauss and Corbin 1990). Thus, in Grounded Theory data analyses starts already when collecting the data. Theoretical sampling is a way of choosing informants or cases to obtain new empirical data (Bryman and Teevan 2005), where the number of informants is based on theoretical saturation of emerging categories – a state in which no new data emerge during the analysis. Thus, the interviews for the Paper III were conducted within each group of stakeholders until no new substantive information was obtained.

During the analysis, first the open coding of the collected data was carried out, i.e. initial codes were assigned to relevant fragments of the interviews to condense the large amount of data into categories. After that, axial and selective coding was done; axial coding was used to cluster emerging categories and identify key themes, while the selective coding aimed at recognising specific themes in the analysed data. At the same time, a process of constant comparison was taking place, i.e. comparing categories, themes and the interviewees to one another (within and between different stakeholder groups) and across particular themes (Bryman and Teevan 2005). Patterns emerged through coding, and constant comparisons provided information on the most important factors influencing the conflict in the Białowieża Forest region.

In Paper IV GIS-based analyses were conducted to present 1) ecological connectivity in a landscape in central Sweden, 2) human dimensions of the landscape, in relation to two aspects: present human movement and cultural heritage values in the same area. These examples of ecological, social and cultural dimensions of the connectivity concept were visualized in a quadratic 10x10 km area with a newly established corridor located west of Örebro, southern Sweden, for road E18 between Stockholm and Oslo.

To illustrate ecological connectivity data on the spatial distribution of two vegetation types: deciduous forest and grassland (pastures), considered in Scandinavia as habitats of special conservation interest, harbouring high number of threatened species (Berg et al. 1994, Ihse 1995), were used. Based on these vegetation types maps illustrating allocation of the habitat networks (*sensu* Bani et al. 2002) were created, using two different maximum inter-patch distances, 100 m and 400 m, and thereby illustrating landscape connectivity for two virtual species (Mikusiński and Edenius 2006) with different mobility levels for each habitat type.

To visualise the present human movements in the study area data on the inhabitants' visits in different areas were categorised according to the reported visit frequencies: >2 times per month, 2-4 times per month, 2-4 times per week, 5-7 times per week, and the frequencies were summed. As a result, maps illustrating the respondents' movements relating to particular activities in the area were created.

To present cultural heritage connectivity on a map, two settlement categories were used to model past human movement: a) old hamlet sites before they were split up and moved to other places as single farmsteads, and b) crofts that belonged to a certain hamlet. Linkages between these settlement categories represent one of many daily movements in the past landscape where the crofters, that did not own the croft, got the duties of the day at the hamlet as a form of rent. In order to illustrate the cultural heritage connectivity (Antonson et al. 2010), lines representing movements of people were drawn between the crofts and the hamlets on the thematic map.

### 3.4 Challenges of the interview research

Most of the studies in this thesis were based on the interviews analysis. During quantitative research based on interviews, the role of the interviewer is very important. The interviewer creates the interview situation, asks questions, helps focusing the conversation on the main themes, and clarifies the interviewees' answers

(Kvale 1996). This can potentially lead to a situation where the interviewer's question can lead to particular answers. Such leading questions do not always reduce the reliability of the interviews; nevertheless, the interviewer must be aware of this risk. To minimize such risk, I carried out interviews without previous knowledge on the local situation, which prevented me from presenting my own opinion or involuntarily suggesting some answers. However, I had basic background knowledge, derived from literature and documents review; otherwise it would be difficult to formulate the interview questions. Another possible challenge is that the interviewees could be reluctant to provide information, which they considered confidential. To avoid such reluctance, the interviewees were assured of confidentiality.

Some interviewees, especially those working in governmental organisations, might have tried to provide "correct" information to show their institution in "the better light" (Kvale 1996) – corresponding to the phenomenon of so called "social desirability" (Graziano and Raulin 2010). This can be done even unconsciously, without the aim of misleading the interviewer, but simply because of the fact that the interviewed person believes the "correct truths" dominating in the particular organisation. If a study is based on interviews that focus on a group of stakeholders from only one organisation, or organisations closely related to each other, the result can be biased, because only one "story" or one particular "truth" is represented. Additionally, in the situation of conflict over biodiversity important area (like in case of Paper III), strong emotions can play a role, and thus, emotionally biased stakeholders may present only one "side of the story". Therefore in the studies where interviews were the main source, I interviewed all relevant stakeholders' categories/groups. In Paper I, I interviewed representatives of the same organisations in two different regions. In Paper II, road planners from several different regional offices of road authority were interviewed. In Paper III, presenting a conflict situation, the interviewees were chosen to represent various groups of stakeholders, from both sides of the conflict.

I carried out all the interviews myself (with the exception of the interviews with Swedish road planners in Paper II), so that the way of conducting of the interviews was as uniform as possible.

## 4 Planning processes in Poland and Sweden

### 4.1 Regional planning in Poland

Regional planning in Poland is a duty of both the regional administration and the Regional Bureaus of Spatial Planning, RBSP (hereafter called together “regional planners”). For Paper I regional planners from two regions (administrative units called in Polish “województwo”) in eastern Poland: Podlaskie and Podkarpackie were interviewed. The selected planners were specifically chosen to represent departments that explicitly dealt with the biodiversity and other environmental issues in the regional administration. The planner’s offices were located in Białystok (Podlaskie) and Rzeszów (Podkarpackie).

Spatial plans are prepared at two levels. First, local plans are prepared at the municipality level. Second, the Regional Bureau of Spatial Planning elaborates a regional plan, encompassing the whole region, in the scale of 1:300 000. Both local and regional plans need to be accepted by the regional administration that checks their compatibility with the legal environmental requirements, including biodiversity conservation. However, they can formally influence only protected areas located within and in close proximity to the plans. For plans in other areas they can only provide recommendations for improvements. Until both local and regional plan get accepted they are subject to public participation, in the form of comments from the all interested stakeholders. The comments need to be taken into account by the regional administration before the final decision is made.

The regional administration is also crucial in the process of investment (e.g. roads) planning, as they give the final decision if a planned investment can be realized (so called decision on environmental conditions, see section about road planning). Additionally, all investments need to be in line with the regional plan.

### 4.2 Road planning in Poland

Road planning in Poland is a responsibility of regional offices of the Polish National Road Authority (PNRA). PNRA is located in Warsaw and comes under the Ministry of Transport. There are 16 regional road administration offices in Poland. Each regional office is divided into several departments, dealing with particular aspects of road planning. Environment Protection Department takes care of environmental issues. Their main task is to supervise and accept all the planning documents prepared by the consultancy companies, in relation to environmental issues. The Documentation Department organises a process of public consultations at the early stage of EIA procedure. These two departments were of interest of studies presented in Papers I and II. In Paper I road planners from these two departments from two regional offices were interviewed: in Białystok (in Podlaskie region) and in Rzeszów (Podkarpackie region). In the Paper II results of interviews with planners from 7 different regional offices are presented.

Studies presented in Papers I and II in Poland concern the legal situation before the changes in legislation in November 2008 (PME 2008). In the Polish EIA framework as it stood until late 2008, EIA was carried out for three groups of projects that could significantly affect the environment (Council of Ministers 2007):

- I. Projects that always required an EIA report, e.g. motorways, express roads and national roads with minimum four lanes and length of 10 km.
- II. Projects that could require an EIA report if the regional administration decided so. Public roads not included in Group I belonged to this group.
- III. Projects that required an EIA report under certain conditions, for example if they could considerably influence Natura 2000 sites. The regional administration decided whether a report was necessary for this group.

Prior to November 2008, planning of public roads in Poland comprised three stages (PNRA 2005, 2008); the early stage – where initial documentation for the further planning process was prepared; the second stage – where the investor (i.e. PNRA) presented a minimum of two options for the route (besides the ‘zero-alternative’) for the deciding authority (in this case the regional administration), together with an application for a decision on environmental conditions (PME 2005); and the third stage – the construction stage, including exact road location and road construction. The EIA procedure started at the second stage of the road planning process, and consisted of five stages: (1) screening, (2) scoping, (3) EIA report, (4) public participation, (5) decision on environmental conditions (PME 2001, 2005). However, if it was decided after screening that a particular project did not need further EIA and preparation of an EIA report, further steps of the EIA procedure were omitted for that project (see Figure 4).

The new legislation from 2008 slightly changed the road planning framework (PME 2008). It made the regional director of environmental protection responsible for decisions concerning roads and introduced the obligation to carry out an EIA if an investment could potentially significantly influence Natura 2000 sites. It also introduced the possibility of carrying out a second EIA for public road investments (but not motorways), after the decision on environmental conditions was made, if the application for a road realisation decision contained changes in relation to the requirements of the decision on environmental conditions.

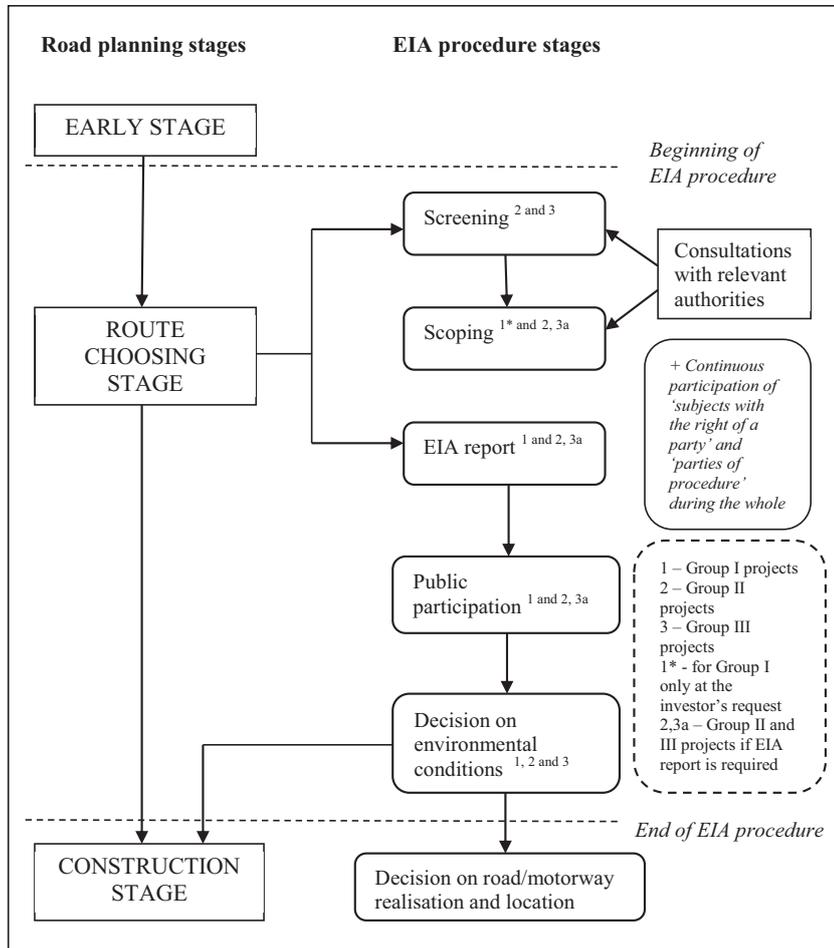


Figure 4. EIA in Polish road planning prior to legal changes in 2008.

### 4.3 Road planning in Sweden

The Swedish National Road Administration and its regional offices are responsible for the road planning in Sweden. The road planning consists of four main stages: initial study, feasibility study, design plan and construction phase (see Figure 5). The initial study aims at deciding whether there is a need for a new road at all. If it is decided that there is a need, the procedure continues with the feasibility study where alternative road corridors including a zero alternative are investigated. The design plan is the third stage, where the more specific location and design are established. The fourth stage deals with technical details and time schedule regarding the construction (SNRA 2002).

The EIA process is integrated into the road planning process, and is intended to start already in the initial study through the consultation which is intended to give input to the EIA report and process.

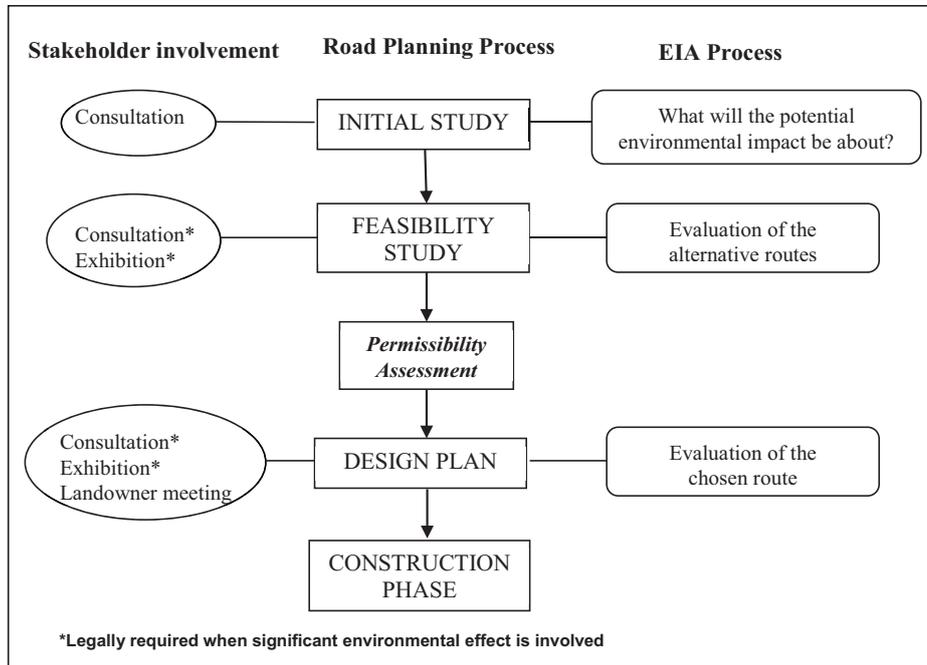


Figure 5. EIA in Swedish road planning.

#### 4.4 Forestry planning in Poland

Forestry sector in Poland is dominated by the state ownership; over 80 % of forest is state owned. State Forest (SF) National Forest Holding is a hierarchical, financially self-sufficient organization managing the Polish state forests. The highest level of the forestry administration, SF General Director, comes under the Ministry of Environment. The next level of forest administration is 17 SF Regional Directories. The next level is forest management district, divided into sub-districts (Figure 6).

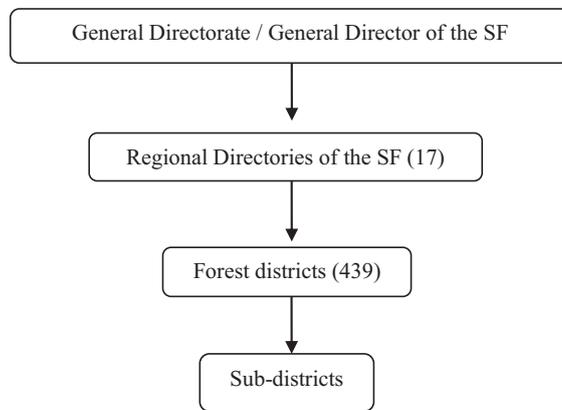


Figure 6. Organisation of the State Forest (SF) National Forest Holding in Poland.

Actual planning and management on the ground take place at the level of forest district, based on annual management plans prepared by SF representatives. All management activities in a forest district are carried out according to the plan. In case of unexpected events (like wind or snow induced damages) the changes in the plan have to be consulted with the Regional Directorate. In some cases, additional rules and restrictions for management could apply to particular areas. In Poland there are 19 Promotional Forest Complexes (PFC) which main goal is to promote multifunctional management of forests as an element of sustainable development (Rykowski 1997). In PFC special rules of management are implemented. The forest districts that are of interest of the study in Paper I were all included in PFCs. These were: Białowieża, Browsk and Hajnówka districts in the Podlaskie region, and the Bircza forest district in the Podkarpackie region. In Paper III foresters from two forest districts: Białowieża and Browsk were interviewed.

Forestry planning in Poland is a process almost entirely separate from other planning sectors. Regional administration can give opinion on the forest management plans, but cannot formally influence their contents.

## 5. Results

### 4.5 Paper I

Paper one investigates how planners from three sectors: regional planning, road planning and forestry in two regions of eastern Poland handle the issue of biodiversity conservation in their work. In the context of on-going economic development in Poland, including large scale development of transport infrastructure, which poses threats to the long-term maintenance of biodiversity, the extent to which Polish planners are able to cope with biodiversity conservation in efficient way is highly relevant. Additional dimension important in planning for biodiversity is involvement of the general public in the planning process. Paper I, thus, investigates Polish planners' understanding, ability to act and will for the implementation of biodiversity and public participation policies in their work. Tables 1 and 2 present a summary of results, comparing them with the normative model.

#### 4.5.1 Biodiversity conservation in planning

Representatives of three planning sectors investigated considered mostly national legislation acts as a base for their work. Additionally they frequently mentioned the EU Bird and Habitat Directives as important for planning. Only one regional planner mentioned the ELC. All of the interviewed regional and road planners claimed that they understood the need for planning over large spatial extents, and the importance of habitat connectivity. Still, their practical planning work was conducted in very small areas, such as the area of a particular planned investment, or a 1-km narrow strip of land along the planned road. This was caused by both lack of proper legal tools that would allow appropriate regional level planning and a limited amount of proper data on biodiversity values in particular areas, as well as lack of GIS tools enabling such planning. The forestry sector representatives also planned for biodiversity conservation only at the local scale and implemented biodiversity considerations at the level of particular forest stands or in a local management district. The interviewed foresters' perception was that existing protected areas such as nature reserves fully secured the most important values of the forest and they did not mention habitat connectivity as important. Consideration of cultural landscape biodiversity was almost entirely neglected by planners from all three sectors.

Table 1. Comparison of planning processes for biodiversity conservation in three sectors in Podlaskie and Podkarpackie regions in Poland with the normative model based on policies about biodiversity conservation (√ indicates that a certain attribute of a normative model exists at least to some extent in a planning process, and O indicates that a certain attribute is missing in a planning process in regional, road or forestry sector).

	Regional	Road	Forestry
<i>Understanding:</i>			
Relevant international policies	√	√	√
Biodiversity as species, habitats and processes, at multiple scales (local, management unit, regional)	○	○	○
Cultural biodiversity	○	○	○
Need for large area planning	√	√	○
Need for inter-sectoral and international co-operation	√	√	○
<i>Ability to act:</i>			
Financial resources, time, staff	○	○	○
Knowledge	○	○	○
Spatial data, tools	○	○	√
Other legal and practical aspects	√	○	○
Possibilities to co-operate with other sectors	√	√	○
<i>Will to act:</i>			
Importance of biodiversity conservation for the planning unit and for the individual planners	√	√	√
Opinion about Natura 2000, as a tool for biodiversity conservation	√	○	○

All planners struggled with a lack of basic resources needed in their job. This was especially evident for the regional spatial planners who were limited in terms of staff, computers and sufficient office space. The regional planners possessed small-scale topographic maps, orthophoto maps, land-use maps and maps with borders of protected areas, but no data from detailed surveys of species and habitats at the local level. Road planners had detailed survey data on species and habitats, but only within the proximity of the planning object, i.e. the road. The main basis for regional and road planners' work was the data provided by the authors of the transport infrastructure development plans (e.g. species or habitat inventory data), often poor in quality, according to some regional planners. Both regional and road planners needed to individually search for information from additional sources. Only forestry planners had broad data on the state of their forests in a GIS-based system. In contrast, none of the regional and road planners used any GIS-based computer systems, and had only basic topographical maps available electronically. To support implementation of the Natura 2000 network a GIS data base was being created for the designated sites, but not for their surroundings.

There was some established cooperation among different sectors, mainly in the form of commenting on documents or information exchange. Although data exchange was fairly common, it often relied on personal contacts, and was not formally organised, neither compulsory. Both regional and road planners emphasised that they did not interfere with forestry sector planning activities and that the forestry organisation was acting separately from other sectors. Nevertheless, in many cases foresters provided other planners with useful data (e.g. the forest inventory data).

Regional administration complained that local authorities had no financial resources to cover the entire area of municipalities with plans, so that the plans were prepared only for individual, small, disjunctive areas. Regional planners also criticised the fact that they could legally influence only plans that could have impact on protected areas. The regional spatial plan prepared by the RBSP was a potential tool to strategically plan for the whole region. However, the scale of the plan was so small that it did not allow insight into details of the region. Additionally, the RBSP representatives focused mostly on the individual protected areas when preparing the plan.

In general, all planners were positive towards biodiversity conservation; however, how positive they were depended on their professional responsibilities. The main task of the regional planners was to take care of ecological issues, and they seemed to be very willing to work with biodiversity. However, one regional planner believed that for the whole administration work with biodiversity (and in general the environmental issues) was not a priority, and that there were many obstacles in implementing biodiversity policies. At the same time two others claimed an undergoing change in that the administration was becoming more positive towards conservation issues in general. Road planners also claimed that biodiversity needs to be maintained, but underlined that their main responsibility was to build roads, and the only thing they can do it to “try not to harm”.

All interviewed foresters claimed that their management allowed maintaining biodiversity, which was considered one of the main tasks of forestry sector. Nevertheless, some emphasised that local people’s needs were still more important to take into consideration than planning for biodiversity conservation. This opinion was especially evident in relation to the Natura 2000 network. Natura 2000 sites were believed to cover too large areas and impede local development.

In general, the attitudes towards the Natura 2000 network differed among individual planners. Most of regional administration representatives believed that Natura 2000 could be a very good tool for biodiversity conservation. Still, some of them criticised the fact that Natura 2000 sites had no protection plans. A majority of other planners considered Natura 2000 as an impediment to economic development and seemed not willing to work with this form of protection.

To sum up, there were several gaps between the normative model and the practical planning. The main bottleneck seems to be lack of important resources, both in terms of money, as well as necessary data and planning tools. Additionally, knowledge on the need for planning at multiple levels and considerations for cultural biodiversity were missing. At the same time, attitudes towards biodiversity conservation were rather positive, notwithstanding different priorities given to conservation by the representatives of particular sectors.

#### 4.5.2 Public participation in planning

Public participation in planning seemed not to be a big issue for the interviewees; the interview answers were generally short and brief. However, there were some exceptions: one road planner mentioned the Aarhus convention (UNECE 1998), and one regional administration representative mentioned democratisation of the country in relation to public participation. Nevertheless, other planners talked about public participation only in relation to national legal acts and internal documents of their own organisations.

For the majority of interviewed planners, public participation was something that was undertaken to comply with the legal requirements, or to avoid conflicts. However, little was said about the rights of the public to be involved in a transparent planning process. On the contrary, the interviews revealed planners’ limited respect for perceptions and attitudes of the broad public. Regional and road planners claimed that

individuals and the representatives of NGOs (non-governmental organisations) often did not have any professional knowledge and that external stakeholders only protested “just to make planning more difficult”, to “get applause”, or to “prove themselves, show themselves, without having idea of what they do”. One interviewee from regional administration said that “people just quarrel and to control it all is difficult, so it is better not to gather them in one pot”.

Many of the interviewed planners believed that experts should take final decisions in planning. Road planners underlined that they listened only to “reasonable” comments, i.e. arguments not undermining the planner’s presumptions about the road project. Foresters claimed that they were the one who “know how the forest management should look like” and “it would be best if as little as possible people disturb them”. Regional administration interviewees responsible for public participation believed that the public had too much power and overused it to slow down particular investments.

*Table 2. Comparison of public participation in planning processes for biodiversity conservation in three sectors in Podlaskie and Podkarpackie regions in Poland with the normative model (√ shows that a certain attribute of a normative model exists at least to some extent in a planning process, and O indicates that a certain attribute is missing in a planning process in regional, road or forestry sector). PP = public participation.*

	Regional	Road	Forestry
<i>Understanding:</i>			
Relevant international policies	O	O	O
PP as deliberative process, i.e. open, accountable, reciprocal, integer and involving learning	O	O	O
<i>Ability to act:</i>			
Mechanisms/tools for enabling PP as deliberative process	√	√	O
Financial resources, time, staff	O	O	√
<i>Will to act:</i>			
Importance of PP	√	√	O
Function of PP	√	√	O
Positive attitudes towards present PP as deliberative processes	O	O	O

There were several mandatory mechanisms enabling public participation in both the regional planning and road sectors. All of them were open to all interested stakeholders. The main method of public participation was the submission of written comments to be considered by an authority. Open hearings where anyone could come and discuss plans were organised only in the case of controversial projects. In addition to the mandatory participation, road planners organised their own public consultations, not required by legislation, but recommended by internal road authority guidelines. However, planners complained that such consultations were time-consuming and that they lacked experienced people to handle them. Road planners and regional planners complained that the public did not provide much information of relevance for biodiversity conservation. They also complained about the “unrealistic” comments that the NGOs provided too late in the planning process.

Most of the regional and road planners said that participation of the public in planning was important. Nevertheless, they organised it mostly because of legislative demands or to gain useful local information and avoid conflicts. Two of the interviewed regional administration representatives indicated that public

participation is important for the planning transparency, saying “participation is needed so people know what is going on”.

The forestry sector did not organise any public participation and the interviewed foresters did not show any desire to include the public in their planning activities. The only organised contact with the public was education of the society about forest management. Foresters also informed people about the reasons for their activities, in case of occurring conflicts.

Summing up, public participation in Poland seemed to be not well-developed yet and was far from the ideal of deliberation. Most of planners considered themselves as experts who should decide about the outcome of the planning processes, and treated participation of public in an instrumental way.

## 4.6 Paper II

Paper II investigates how the road planners in Poland and Sweden implement public participation policies in their practical work. More precisely it deals with the norms of involvement of different stakeholders – both relevant authorities and the general public (i.e. public participation), as employed in EIA in road planning in both countries.

This study focuses on three contextual aspects: (1) legal frameworks and what they say about stakeholder involvement in EIA; (2) formal and informal arenas for stakeholder involvement and what happens in them; and (3) norms in relation to stakeholder involvement in EIA as expressed by planning practitioners (i.e. road planners).

### 4.6.1 Stakeholder involvement in Poland

There were three formal arenas for stakeholder involvement in Polish road planning. First, relevant authorities were consulted at the stage of screening and scoping of EIA. Second, there was the continuous participation of ‘parties to procedure’ and ‘subjects with the rights of a party’, who had access to all documents, and could submit comments during the whole EIA process. They also had a right to appeal or lodge complaints against the decision on environmental conditions. Third, the general public could take part in public participation happening as a specific stage of the EIA process, before the decision on environmental conditions was taken. This public participation consisted of notification of the public about the particular planning case, time for comments to be submitted by the public and consideration of the comments by the regional administration before they took the final decision. In addition to these legally required arenas, the official handbooks on road planning recommended planners to organize further consultations with the public. This was done in form of “extra consultations” – a range of meetings with the public in municipalities close to a planned road. The interviewees confirmed that many local residents used this opportunity to come and express their opinions, but according to the interviewees the NGOs representatives did not often take part in the consultation. Additionally, the citizens frequently came to the regional PNRA offices to ask questions and give their opinions. The interviewees called these unscheduled meetings public participation as well, and they can be considered an additional arena for stakeholder involvement.

Until 2008 (i.e. the changes in legislation) the citizens and NGOs (i.e. the general public) had different rights than the public authorities with regard to participation in road planning. Public authorities could get involved early and could therefore influence the decision on whether an EIA report was needed and what its scope should be. Citizens and NGOs without rights of a party could get involved only when an EIA report was required (i.e. quite late in the planning process). Therefore their possibility to influence the

existing proposal was limited. However, the interviewed planners believed that space provided for these stakeholders was good and not at all too late. In relation to that, one of the interviewees said: “before [the EIA report is ready], there is nothing to talk about”.

The final decision on environmental conditions issued at the end of the EIA process should include information on how the comments of the general public have been taken into account. This is an evident sign of accountability; however there is still no assurance that the comments will make any difference. The main form of interaction for the public, getting information and submitting comments, indicates a process that is neither open nor reciprocal and does not involve mutual learning. Changes in the legislation in the late 2008 slightly broadened the possibilities for input by the general public by giving NGOs extended rights to appeal or lodge complaints and by providing the possibility for electronic form of comment submission. Nevertheless, the process seems still far from the deliberative, as defined by Hajer and Versteeg (2005) (see section “Public participation and deliberation”).

Road planning handbooks define the informal routines for “extra consultations”. These consultations are seen as important for informing the local community about a planned road, as well as for preventing potential conflicts. A difference can be seen between the handbooks from 2005 and 2008. The former one provided only instrumental reasons for the consultations, such as conflict avoidance, etc., while the latter sees extra consultations as a strategic measure for building trust, enhancing democracy, activating civil society and making it possible for citizens to learn and to express their opinion. The interviewees believed that the practice of “extra consultation” is very valuable for the planning process, especially in terms of getting useful local information at the early stage of road planning. Additionally, according to the interviewees, the interaction often helped to make plans more acceptable by the public and in this way to avoid conflicts, build trust and reach consensus. Some interviewees stated that such consultations could lead to increased efficiency, transparency and credibility by getting people “on our side” and thus making the process easier and faster.

Several of the planners expressed the strong support for openness, dialogue and transparency, which seems to be close to the deliberative ideal. However the main function of stakeholder involvement seems still fairly instrumental. The planning practitioners took into account information provided by local people only when it was “reasonable”, and apparently controlled the agenda so that the consultation did not challenge the project in itself, but rather added comments on specific details and design aspects. The planners believed that they were experts who should decide over the road project. To sum up, the main function of public participation seems to be to make the process smooth and not to develop a deliberative, unbiased procedure that involves mutual learning.

#### 4.6.2 Stakeholder involvement in Sweden

In the Swedish EIA, involvement of stakeholders is encouraged throughout the whole EIA and road planning process (the idea of continuous consultation). In practice, there are three formal arenas for involvement of different stakeholders, at three different stages of the road planning process. One is the consultation that already happens in the initial study with an aim to start a dialogue with the general public, authorities, organisations, the business community and other relevant stakeholders. The road planning handbook especially underlines the importance of engaging women and children and of publicising the consultation broadly, e.g. by notification in a local newspaper or by letter. Several forms for this stage of consultation are mentioned, such as consultative meetings, open house or written consultation. The stakeholder involvement at this stage is supposed to give input to the county board’s decision on whether there is any significant environmental impact of the road project. The result of the consultation is summarised in a report, including information on if and how the comments were considered.

The second and third arenas are the consultations arranged at the stage of the feasibility study and at the stage of the design plan. Main stakeholders to be considered at these stages are public authorities, municipalities, local NGOs, and the individuals who are directly concerned, for example, land owners. For roads with a considerable environmental impact, an exhibition, where the EIA report and the road plan are displayed for the public, is arranged at the stage of the feasibility study. An exhibition is also mandatory in the road design stage.

The viewpoints and proposals for change have to be included into a report, which must contain justifications as to whether they have been taken into account or not. At the stage of the design plan there are also mandatory meetings with landowners and property owners as an additional arena for the involvement of particular stakeholders.

The idea of continuous consultation was very visible in the interviews. The road planners underlined that they very much tried to be open and to invite stakeholders such as the public and NGOs to the meetings already at the initial stage, with an aim to investigate the area where a new road could be located.

Very positive attitudes towards involvement of different stakeholders, including the public, in the planning process were visible in both the Swedish framework (legislation and handbooks) and the interviews with the practitioners. The interviewees talked about creating trust and being open so that people would feel that they have a chance to get involved. Early stakeholder involvement was seen as an important strategy to avoid problems in the planning process. The planners believed that the interaction with the relevant stakeholders increased the quality of both the EIA and the road project itself, and provided opportunities for the planners to learn from the residents about the local conditions. However, there was also an instrumental norm that occurred in the interviews. It was clear that the planners sought for information that would facilitate a smooth planning process, and not any new knowledge leading to profoundly revised plans. Moreover, the interviewees had different relation to different kinds of stakeholders. One of the planners explained that meetings with the public tended to be more about information and answering questions, while meetings with the organisations were more frequently “united work”.

#### 4.6.3 Comparing Poland and Sweden

It is visible from the results that the legal frameworks and the arenas for stakeholder involvement differ greatly between Poland and Sweden. The Polish framework from until late 2008 provided fewer possibilities to stakeholders to get involved, and differentiate stakeholders into groups with different rights, where the general public had fewer possibilities to get involved than the other stakeholders (i.e. authorities). The Swedish legal framework seems to be more clearly influenced by deliberative norms, providing equal opportunities for different stakeholders to engage in the process. Ideas of openness and reciprocity are strongly visible in the principle of continuous consultation. However, the Swedish legal framework seems to carry ambivalence: in the later stages of the road planning process citizens (i.e. the general public) are mainly ‘targets for information’ rather than participants in a dialogue and only some groups of stakeholders are really included in the process. The deliberative ideal thus coexists with a strong instrumental norm.

The two countries appear to be much more similar than suggested by the formal frameworks when one scrutinises the practice of the informal arenas and routines for stakeholder involvement. Polish practice contains a number of well-established informal possibilities for stakeholder involvement, giving much more space for the general public to be included in the process than it is legally required. This indicates greater openness that it is visible “from the first sight”. Nevertheless, the informal character of this participation means that it is not really transparent or accountable.

The main finding is that norms held by practitioners (i.e. the road planners) play a decisive role for what really happens in the planning process. The frameworks and the interviews with practitioners from the two countries revealed certain deliberative norms, nevertheless, interviewees from both countries gave a strong expression of traditional, top-down norms, where interaction with some groups of stakeholders (i.e. the authorities) is more significant for the EIA and road planning process than the interaction with other stakeholders (i.e. the general public).

Even if the legal frameworks of Poland and Sweden varied considerably, the practical planning seemed not to differ so much. The public participation practice in both countries was found to be more about informing and getting information from the public than about real communication or deliberation. The planners tended to make a clear distinction between the “experts” and the public, and the knowledge provided by these two groups of stakeholders.

#### 4.7 Paper III

In Paper III the conflict in the conservation process of biodiversity in the Białowieża Forest was investigated. The Białowieża Forest is a Pan-European biodiversity hotspot, the last large remnant of near-natural lowland temperate forest in Europe (Faliński 1986, Tolkach et al. 1997, Vera 2000). For centuries it has boasted favourable conservation status by virtue of being deemed a royal game reserve (Samojlik 2005). The management changes introduced during the 20<sup>th</sup> century actually threatened the values of this area (Kirby et al. 1991, Wesołowski 2005, Wesołowski et al. 2005, Czeszczewik and Walankiewicz 2006). For two decades scientists alongside environmentalists have been battling with foresters and local residents wanting a more effective protection of the forest, while their opponents want to keep the *status quo* of the current management. This conflict exemplifies how different local stakeholders can get involved into the issue of biodiversity conservation, and influence an important biodiversity hotspot.

##### 4.7.1 History of the Białowieża Forest

The Białowieża Forest was already in the fourteenth century set aside as a royal forest. It was used by royal families exclusively for hunting (Samojlik 2005). From the fifteenth century the forest was protected against poaching and illegal woodcutting by almost 300 rangers. In the eighteenth century, some grazing and game-breeding was organised, but still there was no forest management conducted there (Bobiec 2002). Commercial forestry started in the beginning of the twentieth century. During the two World Wars massive logging in this area were carried out by the successive occupants and the Polish foresters (Korbel 2005). Efforts to protect this forest started already in 1921 when a strict reserve core area of 4700 ha was established in the Polish part of Białowieża Forest. In 1932 the BNP was created, based on this core area. In 1972 special rules of management were introduced for the remaining, managed part of the forest. In 1996 the BNP was enlarged and now it covers slightly over 10,500 ha. Half of the BNP (core area) is a strictly protected reserve with no management, while the other half is an active protection reserve. The rest of the forest that is not included in the national park is managed by the State Forest organisation and is a “Promotional Forest Complex”.

##### 4.7.2 Two visions for the Białowieża Forest

The interviews with the main stakeholders in this conflict revealed a strong division into “local” people (municipality representatives and foresters) and “people from outside” or “newcomers” (BNP representatives, scientists and environmentalists). This coincided with the two sides of the conflict, with “locals” willing to maintain status quo of the forest management regime, and the “newcomers” wanting to increase forest protection (e.g. by enlarging the national park).

The main argument for increased protection of the Białowieża forest pointed out by the “newcomers” was the uniqueness of the Białowieża Forest at the European scale that is threatened by the forest management. They supported their claims with the strong scientific evidence to illustrate the harmful impact of the management on the forest. They did not believe in that locals wanted to protect the forest, as they claimed. Instead they believed that local’s attitudes were determined strictly by economic concerns. First, as the ‘newcomers’ believed, foresters feared that their salaries would be much lower if they worked in the increased national park than if they remained in the SF organisation. Second, municipalities would lose money if the BNP were enlarged, because the tax municipalities got from protected areas was 50% lower than from the regularly managed forest. Additionally, according to the interviewees, local people were afraid of losing access to the forest, and in result losing jobs related to forest wood resources, and possibilities to collect non-wood products. The interviewed environmentalists, scientists and BNP representatives answered to that that benefits from tourism activities based on ecological and aesthetic values of the well-protected forest would compensate local people the costs of increased protection.

However, the “locals” assumed that nature-based tourism could not compensate their losses and believed that park enlargement would restrict local people’s access to forest products and increase poverty and unemployment in the region. Particularly, the issue of lower tax from protected areas was the municipalities’ greatest concern, as the municipalities needed the tax money to satisfy the basic needs of local community. Additionally, the local stakeholders believed that protected areas were an impediment for investors and restricted opportunities for regional development. According to one of the municipality representatives the untouched, valuable nature was “a punishment for municipalities”, because it gave more costs than benefits. The “locals” complained that the “newcomers” came from “outside” (i.e. other parts of Poland) and wanted to completely change the life of local people, without caring about their needs. One interviewee expressed it like that: “I can also fight for saving Amazonian Forest because it does not directly influence my life”. On the other hand, the interviewed “locals” underlined that ecological values of the region were also important for them, but they just had to also think about the welfare of local people.

The two conflicted groups of stakeholders understood differently what kind of management was good for the biodiversity of the Białowieża Forest. The stakeholders who wanted increased protection of the Białowieża Forest believed that natural processes were better for biodiversity than steering through human management and that leaving the forest without intervention would lead to the return of its natural state. On the other hand, foresters underlined that “the forest needs human influence to grow well” and that without tending the forest would change its current, desired character. They were convinced that what they learned as foresters was “how it should be” in the forest and that a forester was a “master” who shaped forest and set nature in order. However, as one of the BNP representatives said “the management that foresters conduct would be biodiversity friendly in any other forest in Europe, but it is not enough for the good protection of such a special forest as Białowieża Forest”. The interviewee meant that foresters managed the Białowieża Forest in the same way as they managed other Polish forests, as they learned during their professional education, but not taking into considerations the special character of the Białowieża Forest. The municipalities did not have own presumptions about the ecological conditions and management of the Białowieża Forest, but they agreed with the forester’s vision of the forest. This was a consequence of their close relations with foresters, whom they trusted. Both foresters and municipality representatives believed that it is owing to the local people management that the Białowieża Forest has maintained its values for centuries.

A fundamental difference could also be observed in the spatial scale at which the particular stakeholders perceived the case of the Białowieża Forest. Proponents of increased protection talked about the need for large non-fragmented forest complexes for the maintenance of species with large area requirements, and underlined the European and international importance of this region. The other group of stakeholders (the “locals”) definitely focused on more local scale. The foresters concentrated their work on particular forest districts and the municipality representatives underlined the need of local communities.

Apart from differing perspectives on how the forest should look like and at what scale to consider it, the persistent tension between the two groups of opponents was also fostered by a mutual lack of trust, which was very evident in the interviews. The advocates of park enlargement accused foresters and municipalities of not caring about nature, but thinking solely about economic benefits. At the same time, the “locals” accused the “newcomers” of not caring of local people.

#### 4.7.3 Post-scriptum

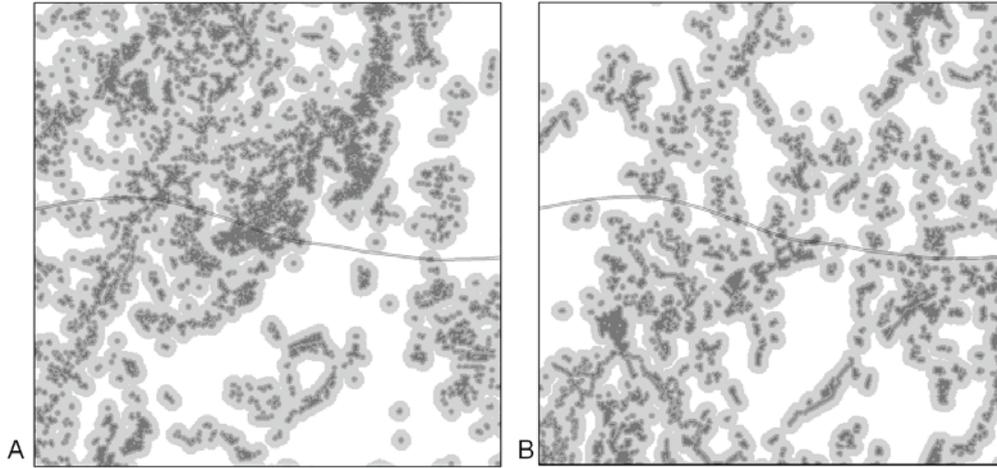
After two decades of an intense conflict, the environmentalists and national-level politicians previously accused of not caring about local situation, put forward a development programme in 2010. The programme to a large extent included local communities’ needs, as well as promised a considerable amount of money as a compensation for the lost development opportunities. To great surprise of the programme initiators, local politicians rejected the plan and again blocked the park enlargement, regardless undeniable benefits of the programme to the local communities. The money (about twelve times as much as the annual local budget) was not a convincing argument for the programme acceptance. The presently advocated approach of merging economic incentives with local considerations failed totally in the face of long-lasting, exacerbated conflict, many different interests, pride and power.

### 4.8 Paper IV

Paper IV discusses the possibilities of using concept derived from landscape ecology (i.e. connectivity) in including human-related issues in landscape planning. First, I illustrate this ecological concept with an example from a study area in central Sweden, and then demonstrate prospects for applying similar concept to spatial considerations for human dimensions of the landscape, in relation to two aspects: present human movement and cultural heritage values in the same area. The main idea is to propose a tool for including these aspects in landscape planning, in line with the European Landscape Convention.

#### 4.8.1 Ecological connectivity

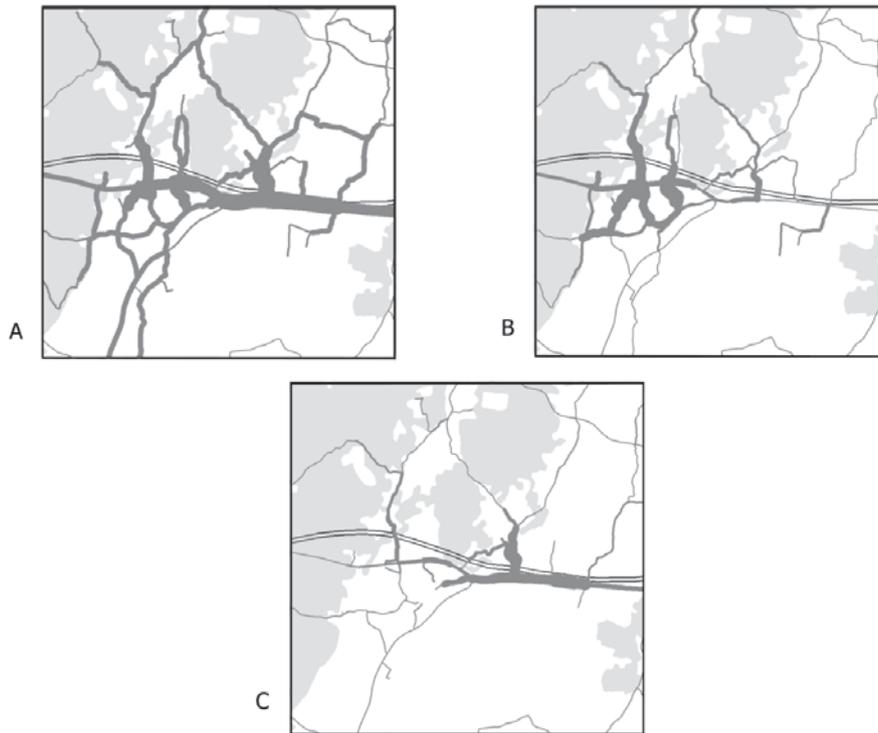
Ecological connectivity has been illustrated by two maps being the outcome of GIS-analysis (Fig. 8). Firstly, a connected network of deciduous forest patches was located from north-east to south-west in the study area in Sweden (Figure 8A). Secondly, the open grasslands formed the largest habitat network in the southern part of the study area (Figure 8B). The use of 400-m inter-patch distance provided a high degree of connectivity for both habitat types, whereas the 100-m inter-patch resulted in generally lower degree of connectivity, especially for open grasslands. The new 4-lane motorway that crosses the study in east-western direction is dividing the largest network of deciduous forest (Figure 8A), that may cause impediment for movement of species dependent on this habitat type. It also divides the largest concentration of deciduous forest located in the middle of the study area. At the same time, the motorway omits the largest network of open grassland, but still intersects some smaller habitat linkages in several places (Figure 8B).



*Figure 8.* Maps illustrating ecological connectivity in the study area from the perspective of an organism being dependent on deciduous forests (A) and an organism being dependent on open grasslands (B). The darkest shading depicts actual habitat patches (i.e. deciduous forest and open grassland), intermediate shading illustrates their connectivity based on physical proximity (i.e. interpatch distance) of 100 m, and finally light shading delineates their connectivity based on physical proximity of 400 m. In addition, the newly constructed motorway is depicted by a double line.

#### 4.8.2 Social dimension

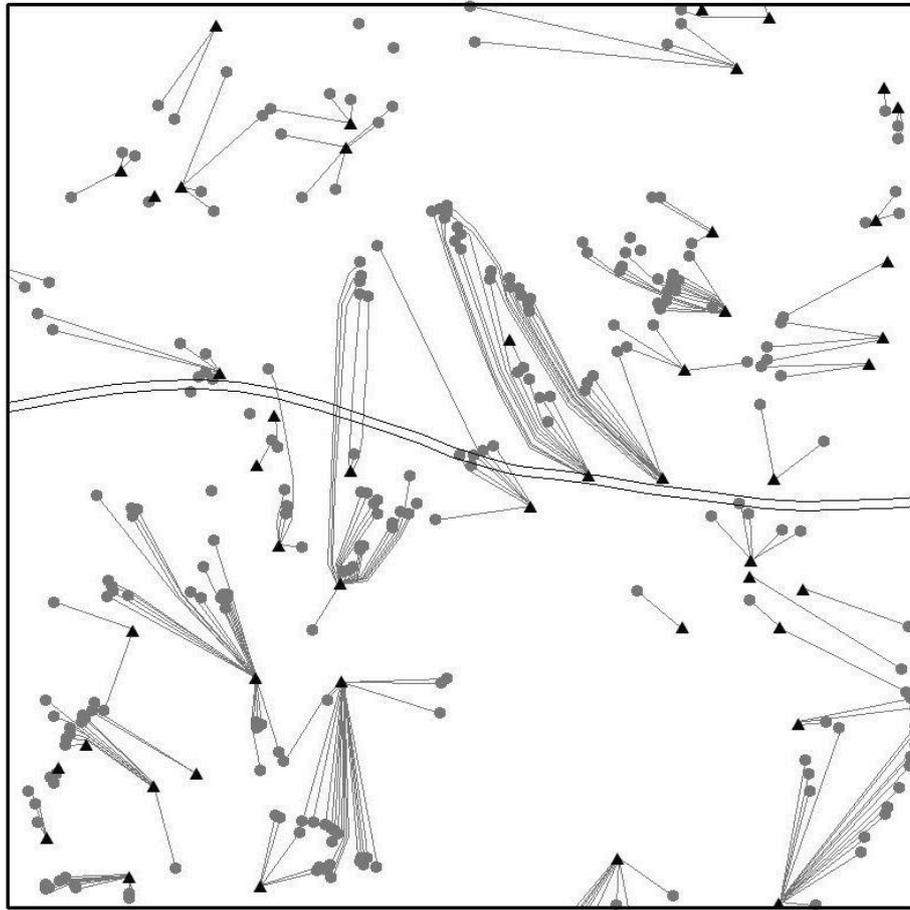
Maps illustrating the respondents' movements relating to particular human activities in the study area are shown on Figure 9. Movements associated with outdoor exercise and recreation were concentrated to the eastern part of the study area, around the town of Lanna (Figure 9B). On the other hand, mobility related to social relations was observed to concentrate to the western part of the study area (Figure 9C). It is noteworthy that, according to our analysis, the respondents did not cross the new road very much. The main movement patterns were concentrated north of the road and most crossings were located in the western part. The map suggests therefore that the new E18 motorway does not constitute any major barrier for daily movements of people in the area. However, people perceived some difficulties to access recreation areas (Henningsson et al. unpubl).



*Figure 9.* Present day social perspective on landscape connectivity based on movement of people linked to their different activities. Figure A illustrate all type of movements, figure B movement linked to outdoor exercising and recreation and figure C movement linked to social relations. The newly constructed motorway is depicted by a double line.

#### 4.8.3 Cultural heritage connectivity

In order to illustrate the cultural heritage connectivity, lines representing assumed movements of people were drawn between the crofts and the hamlets on the thematic map (Figure 10). According to our spatial model, most crofters had to travel relatively long distances to get to the hamlet; the longest were about 3.8 kilometres as the crow flies (Figure 10). The newly constructed road seems not to interfere to a large degree with the historical connections, expressed by the cultural heritage connectivity.



*Figure 10.* Map illustrating cultural heritage perspective on the landscape connectivity. Lines depict deduced movement of people between their houses and work at the farms based on the “stomkarta”. The newly constructed motorway is depicted by a double line.



## 5 Discussion

In this thesis using three different studies (Papers I to III) I show that the successful implementation of policies regarding biodiversity conservation and public participation may require much more than ecological knowledge on how biodiversity should be maintained, and much more than the formal guidelines on how the public should be treated in the planning process. In addition to that, the role of people that directly or indirectly may influence the planning and decision making processes is crucial.

In general, I found numerous obstacles in the planning processes that may negatively influence biodiversity conservation, such as lack of knowledge on what is important in biodiversity conservation, and the understanding of biodiversity issues in general (Papers I and III); lack of necessary resources and tools (Paper I); or instrumental thinking about public participation not allowing for an unbiased, transparent planning process and possibly leading to conflicts (Papers I, II and III).

### 5.1 Planning for biodiversity and the role of planners

Recommendations for biodiversity conservation concentrate on the need to maintain dynamic, multi-scale ecological patterns and processes that in turn sustain species and biota and their supporting natural systems (e.g. Poiani et al. 2000). This implies that, to successfully maintain biodiversity, planners need to take into account a variety of biodiversity related issues at multiple spatial scales (Groves et al., 2002, Groves 2008). In result, they need to go beyond protected areas and aim at a comprehensive planning system that covers entire regions and includes well-developed co-operation between sectors or even other countries (e.g. Miller and Hobbs 2002, Pierce et al. 2005, Mikusiński et al. 2007).

Investigation of planners' work for implementing biodiversity policies in Paper I revealed several differences between the planning practice and the normative model used, and showed that implementation of new policies is a challenging task. Similarly, other studies in countries of Central and Eastern Europe, also revealed difficulties in introducing new environmental policies. For example, Prazan et al. (2004), in their study of the White Carpathians Protected Landscape Area in the Czech Republic identified lack of harmonisation between policy instruments, faulty policy design, and a lack of local citizens' engagement as factors hampering achievement of the conservation policy goals. Another example comes from Ioraz's (2003) study in Romania, where insufficient financial resources, monitoring, enforcement, and the information dissemination capacity of local environment protection agencies were recognized as challenging the country's ability to protect the environment in the long-term. Ioraz (2003) concluded that "periods of economic and social transition are very dangerous to biodiversity conservation". For example, in Poland, Slovakia and Ukraine, the harvesting rate and forest fragmentation of Carpathian mountains have increased much just after the change from socialist state economy towards market economy (Kuemmerle et al. 2007). Also Zellei et al. (2004) in his study of agri-environmental policy systems underlined that evolution of the environmental policy systems of CEE countries have been shaped by their

specific historic trajectories, which influenced their development. Similarly, studies of forest planning in Lithuania by Lazdinis et al. (2007) clearly indicate that policy objectives in the field of forest biodiversity conservation and the related tools are known but not well understood by foresters.

In Poland, one of the main problems was evident lack of understanding of important prerequisites for successful biodiversity conservation among the interviewed planners from the regional, road and forestry planning sectors. To address this issue, there is a need for education of planners that takes into account existing scientific knowledge relevant for biodiversity conservation (e.g. Sandström et al. 2006b, Stokes et al. 2010), as well as the knowledge on the public's attitudes towards biodiversity (Lindström et al. 2006).

Another problem that Polish planners faced was lack of necessary resources and proper tools. This may suggest that biodiversity was given relatively low priority by the planning authorities. An important issue was lack of tools to consider local plans or investments at larger spatial extents, not only deal with one particular locality at a time. One solution could be, for example, to introduce legal demand that a plan concerning particular investments (e.g. road) should relate this investment to an entire region and its biodiversity values, so that the decisions concerning particular investments are taken in relation to the whole potentially affected landscape or region.

The planners investigated in Paper I were in general positive towards biodiversity. Nevertheless, biodiversity conservation was considered as a main goal only for regional planners that dealt particularly with environmental issues. Planners from other sectors, even if responsible for biodiversity issues as well, claimed that they also had other, more important obligations to fulfil, for example road planners' main job was to build roads. An interesting result was that most of the interviewed planners (apart from some regional administration representatives) considered Natura 2000 as something negative that hindered economic development. As Kluvanková-Oravská et al. (2009) claim, the Natura 2000 network in new EU member states has been designed in a top-down manner, based solely on environmental scientific criteria, and without introducing any incentives for biodiversity conservation. That caused frustration among stakeholders (including planners from different sectors) who were not consulted in this matter, and who were faced with unexpected additional costs of conservation or limited development possibilities. Had it been planned fully in accordance with the deliberative intentions of the relevant policies (such as ELC or the Aarhus convention), this frustration would probably be avoided, which, in turn could possibly assist more positive attitudes among planners towards the Natura 2000 network.

Notwithstanding the role of the weak participatory governance in countries in transition (see section below), the results of Paper II indicate that also in countries that since long time fostered democracy, public participation may still not be a deliberative process. In Sweden, the results indicate a discrepancy between what is written in the formal frameworks (legislation, handbooks) and the planning practice, indicating the critical role of planners in implementing in practice what is outlined by the formal frameworks. While the Swedish frameworks hold a strong deliberative norm (and in that differ quite much from Polish frameworks), practical stakeholder involvement does not differ very much from the Polish practice. Despite the successive shift towards more deliberative approaches found in case of both countries, the results indicate that an instrumental norm of planning and decision making is still predominant, so that the environmental considerations given by the public are not so likely to influence decisions.

In Sweden, a deliberative norm present in the formal frameworks was opposed to the less-deliberative practice that to a large extent depended on the norms hold by the planning practitioners. It is clear that the norms of professionals, and the ways these norms shape practice, crucially determine how the policies are implemented (e.g. Kleven 1996, Schrijnen 2005, Primmer in press). Thus, the role of planners is an important contextual factor in policy implementation (Angelstam et al. 2003). A more specific contextual factor is the issue of "expert" and "lay" knowledge. The study in Paper II reveals that planners in both countries distinguish between these two kinds of knowledge, treating "expert" knowledge as more relevant

for the EIA and road planning process. In relation to other practices of environmental decision making, Petts and Brooks (2006) reflect upon how such attitudes and cultures constitute a barrier to deliberation. Thus, there seems to be a need for more explicit discussion and reflection over what is required if we wish to bring about a transition in norms and ideals that the planners hold with regard to stakeholder involvement. Information and education are strategies which may influence and change people's attitudes and behaviour (Gardner and Stern 2002). For example, the concept of connectivity discussed in Paper IV could be considered as one possible tool for education of planners about the need to include social considerations in their work, as well as a tool for increasing awareness of the general public on multiple landscape values. Information and education may be not enough to change behaviour in a short term, as social and personal norms are also powerful determinants of human action (Ajzen 1988, Eagly and Chaiken 1993). Nevertheless, educational programmes may work as a long-term strategy of changing people's behaviour (Lindström and Küller 2008).

The study of Polish and Swedish road planning practice (Paper II) clearly shows the weak role of formal legislative frameworks as a way to regulate planning practice related to environmental issues. It highlights the decisive role of implementing actors in the application of formal frameworks in the planning practice, and is in line with other, similar findings (Cherp 2001, Petts 2003, Bond et al. 2004, Petts and Brooks 2006, Nykvist and Nilsson 2009). These results point to how important it is to consider the norms held by the implementing actors and not rely only on the formal frameworks.

## 5.2 Including the public in planning

Comparison between the normative model concerning public participation in the planning process (Paper I), as well as the results of the study in Paper II suggests that the planning processes in Poland need to be improved considerably with respect to public participation if relevant policies are to be implemented successfully. My interviews revealed that the concept of deliberative participation is almost not incorporated into thinking about planning. Planners seemed not to consider participation of the public in terms of deliberative process where all sides have right to be respected and listened to.

One reason for weakly-developed deliberation in Poland may be the fact that public participation is relatively new in Polish planning practice. Research has found that countries in transition from hierarchical to democratic governance face problems in implementing network-based governance solutions, such as participation of public and cross-sectorial collaboration (Rauschmayer et al. 2009b). This is related to a weak history of participatory governance, and too short time that was given for re-building old, socialist institutions into new democratic ones (Klůvanková-Oravská et al. 2009). In the socialist era little space was given to the public and NGOs in decision making and it was natural to focus on authorities and other state actors who were expected to represent all interests in society (Cherp 2001). According to Klůvanková-Oravská et al. (2009), EU integration may be a driving force for changes in governance of natural resources towards more participatory and multilevel systems. There are some encouraging examples concerning biodiversity conservation with a more participatory oriented approach. For example, Szabo et al. (2008) described positive outcomes of a model for participatory conservation in the Rodna Mountains National Park in Romania, and Lawrence (2008) reviewed several case studies in post-socialist countries and presented concrete experiences that had changed attitudes and working relationships between stakeholders. Nevertheless, evidence from the studies included into this thesis (Papers I and II) indicates that the change may need longer time.

Lack of deliberative thinking in the investigated sectors may also to a large extent originate from the professional identity (Abbott 1988) of planners that consider themselves as experts in particular planning field (e.g. forestry or road planning), and from the tradition of planning as a top-down, hierarchical activity (Klůvanková-Oravská et al. 2009). Undeniably, professional expertise is an essential component of planning, nevertheless, the process of democratisation of transition countries requires changes in the style

of planning towards a more deliberative process (Antonson 2011). Additionally, it has been argued by social scientists that all knowledge may be related to different social dimensions and is dependent on different social requirements (Hagström and Hanson 2003, Allvin et al 2006). Thus even expert knowledge is measured and interpreted by humans in certain contexts (e.g. Healey 1996, Berger and Luckmann 2000), and the final decision in the management of natural resources is always a “social decision” (Messier and Kneeshaw 1999, Purdon 2003). According to Kain and Söderberg (2008), knowledge regarding the interrelation between the global and the local sometimes is expressed as top-down and bottom-up perspectives. They suggest that there is knowledge pertaining to the different activity domains of stakeholders that not only draws on different scientific disciplines but that also emerges from the intermixed use of experiential, tacit, lay, expert and theoretical knowledge. Kain and Söderberg (2008) state that

“...there lies great potential in methods that facilitate the evaluation of different strategies for infrastructural development across multiple evaluation areas – methods that seek to combine knowledge, data and information from a variety of sources into a consistent and sense making knowledge foundation” (Kain and Söderberg 2008).

This also reflects the notion of knowledge that may be interpreted and depends on the point of view of particular stakeholders in a specific context (Flyvbjerg 2001).

The case of Białowieża Forest (Paper III) is a good illustration of that. Here, different “kinds” of knowledge (expert, experiential, lay, etc.) were opposed to each other and, additionally, “spiced” with emotions. Lack of acknowledgement of diverse understanding, needs and priorities (ecology vs. economy, or nature vs. people) has led to a long-standing conflict and jeopardised the fate of this forest’s unique biodiversity.

Conventionally, practical biodiversity conservation is supposed to be guided by scientific knowledge (Bergeron and Harvey 1997, Bergeron et al. 1999, Groves et al. 2002). However, scientific knowledge is generally insufficient for conservation success; sincere appreciation of the social system is also necessary (Fox et al. 2006, Chan et al. 2007). In Białowieża Forest, local knowledge, perceptions and emotions challenged the value of scientific knowledge for the conservation of biodiversity. Scientific evidence presented by the advocates of better forest protection was opposed by the local people’s situation and needs. The lack of real acknowledgement of local people’s needs has led to severe conflict, like in other similar cases (e.g. Stratford et al. 2000, Trakolis 2001, Capitini et al. 2004), and impeded efficient biodiversity conservation. Certainly, scientifically produced knowledge is necessary, however not only to be used by one group of stakeholders to “sanctify” their claims, but to provide a base for co-operation among conflicted stakeholders (Young et al. 2005).

In Białowieża Forest the attitudes of the “locals” were influenced by various factors related to local livelihoods, as the perception of high costs connected to conservation usually impedes the conservation action (Gardner and Stern 2002). To resolve the existing conflict, and consequently improve possibilities for co-operation towards common aims (including biodiversity conservation), stakeholders in favour of increased protection must not only acknowledge the issues important for local people, but also take real action to overcome them. Therefore, in Paper IV I proposed the following concrete actions to the Białowieża Forest conflict, namely: (1) change legislation in a way that would provide incentives for biodiversity conservation; (2) find money (e.g. from the EU) to compensate local people for their costs of biodiversity conservation; (3) find ways other than money to compensate ‘locals’ (e.g. jobs with the same salary for foresters in the enlarged national park), and (4) encourage business development based on methods other than traditional material forest values (Mantau et al. 2001). However, what happened in 2010 in the Białowieża Forest case, i.e. that a development programme was proposed to and rejected by the local communities suggest that money and development opportunities are not enough. Probably this is due to a long-standing character of the conflict where not only many different interests but also pride power and, most of all, great mistrust are in play.

Thus, what seems crucial in the future management of the conflict in Białowieża Forest and similar cases are strategies to cope with the relations between the two groups of opponents. Mechanisms to enhance trust-building and good governance (Baker 2006), such as collaboration characterised by participation, equity and benefit-sharing (White et al. 2005, Young et al. 2005), should be introduced. It has been shown that stakeholder-driven protection actions are more likely to be successful than actions that do not take into account the interests of local communities (Taylor 2009). Such a bottom-up approach does not actually mean that local people should be given exclusive power to decide the future of the Białowieża Forest. Local people's knowledge and their ability to maintain natural resources should not be idealised (Rannikko 1999, Stenseke 2009), and one should not naively believe in a consensus and win-win solutions (Büsher 2008). There will often be both losers and winners, but the challenge is to design solutions in a way that both sides gain as much as possible, and that a kind of "middle ground" is found between different interests. For example, Bogaert et al. (2009) describes a process of designation of several marine protected areas in Belgium, where a shift in policy style from top-down towards a more bottom-up occurred when relevant stakeholders got involved. They demonstrate how this shift improved the designation process and led to increased trust between different stakeholders. On the other hand, they underline that a more participative approach to protected areas designation does not guarantee the best protection of biodiversity, and advocate a policy style that combines top-down and bottom-up approaches in the decision making, where a top-down scientific knowledge is complemented by so-called layman's know-how.

The conflict in Białowieża Forest illustrates a situation relatively common in densely populated European countries where economic local development is opposed to biodiversity conservation (e.g. Savoia 2000, Strijker 2005). The necessity of including the local people (or the general public, depending on the case) has not only lately gained importance in research (Harrison and Burgess 2000, Brown et al. 2004, Švajda 2008) but has also been acknowledged by several international environment-related policies (UN 1992, UNECE 1998, EC 2000). The main problem is that the solutions may differ from case to case, depending on particular context. And, certainly, applying participatory solutions will not solve every conflict over biodiversity. Therefore there is a need for adaptive governance mechanisms that facilitate learning from the problem at hand (Olsson et al. 2004a, Olsson et al. 2007). The case of the Białowieża Forest exemplifies, for instance, that legal issues can be crucial in biodiversity conservation efforts. Here, to better protect biodiversity, the legislation needs to be changed (i.e. tax from protected areas should be at least as high as from the regularly managed forest), so that the costs of conservation can be compensated for the local people and not be an additional burden for local communities.

In general, in case where change in attitudes is necessary, a combination of different strategies, e.g. combining education with legal incentives, may be most efficient (Stern 2000). Of course, in the case of a long-lasting conflict, the crucial strategy is to build trust (White et al. 2005), so that the opposing stakeholders are able to communicate towards a common solution. In trust building, there are three important aspects that need to be considered, namely the knowledge/evidence, the emotions and the credibility of the actors (Hedquist 2002). When we aim at influencing emotions and credibility of the actors, there is a need to invest in long-term communication and cooperation among them by establishing stakeholders' platforms. This kind of platforms has been called "boundary organisations" (Keulartz 2009) or "bridging organisations" (Hahn et al. 2006), i.e. organisations that operate at the interface of different groups.

In November 2008 the Polish government introduced several changes into the existing environmental legislation to improve the process of public participation in decision making (PME 2008). In addition, at the beginning of 2008 the Polish road authority published the "Book of good practice on preparing environmental documentation for public roads" including public participation issues (Bohatkiewicz 2008). This new handbook of the road authorities emphasised the importance of building trust, of democracy, and the role of civil society, and not only instrumental reasons for public involvement. Looking at these actions,

it can be understood that the government of Poland and the road authority started to realise that construction of democratic rules and strong civil society is an important step in the country's development. Probably this can also be seen as a way to avoid unnecessary conflicts with the public. The crucial challenge for Polish authorities is to enhance this development. The open question, given my finding of the current dominance of instrumental thinking about participation among planners, is whether these norms will become embedded in planner's minds, and in practice.

### 5.3 In search for tools to include diverse values in planning

In line with landscape approach and the recommendation of ELC there is a need to include different values in various planning processes; thus also when planning for biodiversity conservation. The problem is that these values are not only very diverse, but also in many cases difficult to grasp, both by planners and the general public (e.g. Stephenson 2010a, b, Vejre et al. 2010). What is needed are simple tools that both allow assessment of particular values and make possible visualising them for planners and the public. In other words, such tools should aim not only at the evaluation of the values, but should also have an educational role. The educational role is especially important in case of values that are less tangible and not easy to grasp intuitively (Naveh 1994). However, this kind of tools has so far been lacking in the planning practice (Antonson 2009 a, b).

Paper IV presents the concept of ecological connectivity and suggests the use of this concept in relation to the social values of landscapes. The examples in this paper illustrate the opportunity to analyse and visualise different landscape dimensions in relation to the connectivity concept. The connectivity concept may be considered as a step toward a common platform for assessment and communication of different landscape issues, traditionally perceived as belonging to different disciplines.

Planning in landscapes that are complex social-ecological systems requires multi- and inter-disciplinary expertise, and often transdisciplinary co-operation between planners and researchers representing different background and knowledge (Sarlöv Herlin 2004, Tress et al. 2006). However, it is still common in planning that ecologists deal with the ecological issues, human geographers deal with the socio-cultural impact and so on, and there is lack of integration of different landscape aspects (Antonson 2011). A common conceptual platform, such as the concept of connectivity, may be helpful for integration of different dimensions in practical planning. The concept can be used both in the assessment of actual landscape values, and to facilitate communication between different actors within the planning processes, e.g. professionals and lay men. It can also be a useful tool for educating planners and the general public on diverse landscape dimensions. The ELC stresses the need for proper assessment of landscapes, awareness raising of the general public and enhancing knowledge among planners on landscapes as social-ecological systems. The ELC implementation work in European countries has by now focused on the identification and assessment of different landscape types, and dissemination of information concerning particular values (Brunetta and Voghera 2008). Uncomplicated analyses, such as presented in Paper IV, resulting in maps that in a simple way visualise issues important for spatial planning may assist planners, decision makers and the general public in thinking about landscapes in a comprehensive way. Simple maps that in a comparable way illustrate both social and ecological dimensions of landscapes may work better in grasping the multifunctionality of the landscapes than elaborated and complex models.

This approach is, of course, a gross simplification of such a complex system as landscape. For example, just in relation to road planning Grazuleviciute-Vileniskea and Matijosaitiene (2010) mention several categories of cultural heritage landscape values. There are much more social aspects that are important in spatial planning than human movements or cultural heritage values. Nevertheless, the concept of connectivity could be considered by planners as one of the tools for landscape values appraisal that could complement other tools.

#### 5.4 Biodiversity conservation and people – concluding remarks

The studies presented in this thesis exemplify the role of people in conservation of biodiversity, but of course do not exhaust the list of issues related to biodiversity conservation and people. The role of planners and the public, discussed in my thesis, are two of the key issues to be considered when talking about planning for biodiversity conservation, but they are not the only ones.

A very important issue, that was only touched upon in my papers is the question of scale. The scale at which biodiversity conservation can be considered may differ, depending on the actual planning context (Norton and Ulanowicz 1992, Savard et al. 2000, Crawley et al. 2001). An important question is what we want to protect and in what time-scale. If we aim at a long-term maintenance of biodiversity (understood as not only variety of species, but also habitats, processes and ecosystems, as well as genetic diversity), there is a need to consider multiple scales – from local scale occurrence of different elements of biodiversity, to regional scale considerations (Kruess and Tscharntke 1994, Levin 2000, Poiani et al. 2000). Additionally, one may also consider different elements of biodiversity at various scales, e.g. a particular species or habitat may be seriously threatened in one particular country and be considered as very important target for conservation, while it may thrive in other countries, being not so threatened in the scale of whole continent. A good example here is the White-backed Woodpecker – species critically endangered in Sweden, but not so threatened in many other countries (BirdLife International 2011).

Moreover, the decision on what to protect is always a social decision, where different interests compete (White et al. 2009). This reflects a very common conflict that occurs in practical biodiversity conservation – a conflict between local and larger scale conservation interests. Some authors discuss the crucial role of local actors in biodiversity conservation efforts (Smith et al. 2009), while others criticize this approach, claiming that “local priorities can be too parochial for biodiversity” (Noss 2010) and advocate “thinking bigger” for conservation, taking into account whole continents (Blicharska and Mikusinski 2011). However, a common clash between different values, interests and needs (both needs of people and biological diversity itself) requires that these two kinds of thinking are joined in one approach that combines both top-down and bottom-up approaches to conservation. The top-down approach, guided by scientific knowledge on what is necessary for successful conservation at the large scale (Bode et al. 2008), should be balanced with a more participatory-oriented, bottom-up approach that includes lay knowledge and local scale considerations for biodiversity, taking into account a specific local context (Pinto-Correia et al. 2006), which resembles some form of co-management (Berkes et al. 1991). Co-management is an approach to solving resource management problems and aims at deliberative problem solving (Olsson et al. 2004b). Carlsson and Berkes 2005 proposed several research steps to investigate co-management, from defining the social-ecological system in question and mapping essential tasks and problems, through clarifying which participants take part in management activities and finding linkages in the system, to evaluation of capacity-building needs and finding practical solutions to the relevant problems. Ultimately, the role of researcher seems to be to prescribe remedies for resource management problems. This does not mean that the researcher should solve particular problems, but that his or her role is to communicate research results and contribute knowledge that may be useful for problem solving (Carlsson and Berkes 2005). In my thesis, the first three papers are analysing particular problems related to resource management, i.e. biodiversity conservation. The fourth paper, however, is of different type and aims at presenting one of possible solutions to the problems encountered in practical implementation of environmental policies. Specifically, it demonstrates possibility to use one concept derived from science in practical communication between stakeholders with different backgrounds. Fry et al. (2007) describe the connectivity concept as one of very promising concepts for integrative research, i.e. research that works on interdisciplinary or transdisciplinary terms, producing knowledge and theory that “emerges from the *integration* of disciplinary knowledge” (Fry et al. 2007). Connectivity concept and other similar concepts may be, according to the authors, very useful in finding a “common ground” for research and theory development, as they possess many “overlapping conceptual zones” (Fry et al. 2007). Thus, the fourth

paper may be seen as an attempt to present one of many possible tools that may help in planning of complex social-ecological systems, i.e. landscape and may also facilitate the participation of public (i.e. problems described in Papers I and II). Moreover, the simple maps like presented in Paper IV may be useful in preventing or even resolving conservation conflicts, because such maps may help building the common understanding of spatial dependencies and functioning of the area in question.

Combining top-down and bottom-up oriented approach to planning and policy implementation requires of course co-operation of different stakeholders, and especially including local, contextual knowledge in the planning process. Participation of the public in decision making is one of the ways to include local values and context in planning. Certainly, one may argue that not including local people would not have any practical implications for the conservation of biodiversity, as the natural values can be best protected by centrally taken decisions (e.g. Wesolowski 2005). However, first, there is a social demand for inclusion in decision making in modern democratic societies (e.g. Kluvanková-Oravská et al. 2009), and second, the practice has shown that not including the local people in conservation has led to conflicts and, in turn, impeded conservation (e.g. Negi and Nautiyal 2003, Young et al. 2005, Blicharska and Angelstam 2010).

Of course, it is not local people that would ultimately take final decisions concerning planning and biodiversity conservation. Here a planner comes into picture. The role of the planner has lately become more and more complex (Roberts 2009, Tress et al. 2006). Even if typically there are still rather strict divisions between particular sectors and regions, new environmental policies demand that the borders between them become less obvious, as there is a need for cooperation between sectors and across administrative borders. That puts specific requirements on the planner who is expected to be a kind of “Renaissance Man“ and not only a specialist in his or her own field. Of course it is impossible to possess deep knowledge on every issue important to conservation and spatial planning, but planners need to be flexible enough to see beyond the traditional boundaries of their profession and be able to both communicate with other relevant actors, and learn from them (Forester 1999). Finally, they need to be willing to actively act for conservation, and in general, for sustainable future of our landscapes. As Gilbert (2011) writes “there is no shortage of solutions, just of the will to implement them”.

To sum up, what is the role of scientists in practical conservation? Because of the complexity of relations between social and natural systems (Holling 2001), as well as their high sensitivity to particular contexts, a challenging task for future conservation research is to find flexible solutions that can be applied in many different practical planning situations. Thus first, the scientists should provide the planners with objective, scientific knowledge and data relevant for important conservation issues. Second, they should be able to communicate this knowledge in an uncomplicated way, understandable for different stakeholders, and provide them with simple tools for understanding the problems at hand. Third, they also need to be open-minded enough to not close themselves in their scientific thinking but to be able to listen to other actors, and especially the local actors, as well, and to reflect on the local context.

In general, the scientists, the planners, and the general public – they all need to learn, to be open and to gradually change their attitudes towards a more holistic, multi-scale, and multi-actor thinking about landscapes and biodiversity (Antrop 2006) that is essential for efficient conservation in our complex world.

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