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## Learning for sustainable forest management: Europe's East and West as a landscape laboratory

- Sustainable forest management aims at satisfying ecological, economic and socio-cultural values in entire landscapes.
- The study of the gradient from the Russian Federation via countries in transition such as the new EU members and Ukraine, and to Fennoscandia, provides interesting knowledge.
- We develop tools to measure the different dimensions of sustainability.
- We compare concepts aiming at sustainable landscapes, such as Model Forest and Biosphere Reserve, with regular approaches for land management.
- Natural and human science methods are combined, in close collaboration between researchers, policy-makers, planners and managers.
- Transparent communication of results to the public through different media is crucial.



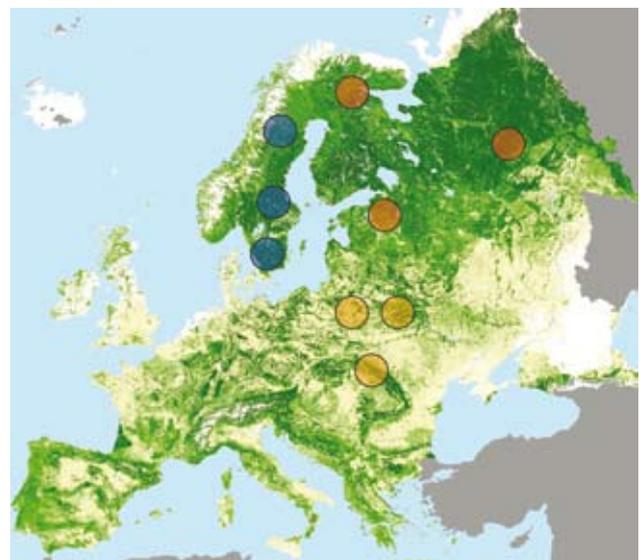
West of the former  
Warsaw Pact



Countries in transition



East of the western border  
of the Orthodox religion



Sustainable forest management is a concept in transition, and innovative work is needed to support its development. We present our systematic step-wise applied research approach made in close collaboration with forest landscape users. Focusing on Europe's northern and mountain forests, we work in a suite of nine local landscapes with different systems of governance typical for Europe's countries and regions in the West, in transition, and in the East.

### Landscapes as social-ecological laboratories

To develop landscape governance and improve the holistic understanding of economic, ecological and socio-cultural consequences of the ways forest goods, services and values are used, produced and managed, it is necessary to have data sets that represent multiple landscape scale management units. Such landscapes form social-ecological systems. Knowledge production to support sustainable forest management requires the use and integration of both natural and human sciences, in close collaboration with the users of knowledge.

Northern and Central Europe's West and East contain steep gradients in all dimensions of sustainable forest management. Many local landscapes are subject to local and regional development projects constituted by landscape scale initiatives such as Demonstration Forests, Model Forests and Biosphere Reserves, in addition to the regular management units without special efforts towards sustainable forest management. The experiences from these efforts provide a resource of new knowledge, which so far is poorly utilised. Responding to the need for applying new approaches to knowledge production, we outline a systematic step-wise approach to learning for sustainable forest landscape management.

### Seven steps for understanding

The challenge of implementing policies about sustainable development in forest landscapes is highly dependent on both tangible biophysical and intangible socio-economic conditions. To understand the state of the sustainability concept's different perspectives in local management units, and the governance process, we conduct field studies in multiple

landscapes representing gradients between Europe's East and West. Our focus is on the Russian Federation, countries in transition from planned to market economy, and Fennoscandia. To alleviate scaling-up from the local to the general level, we carry out a systematic sequence of research themes, which are divided into seven steps (Figure 1).

### Step 1. To identify a case study landscape

Research in support of sustainable forest landscape development with large management units, catchments or administrative units as replicates requires sampling in gradients that represent variation in at least three main dimensions. To cover the bulk of the variation in Europe's East and West, the location of case studies is stratified according to the following factors:

- a. biophysical and ecological conditions
- b. environmental and economic history of forest landscapes, including the property structure of the landscape.
- c. the institutional structure and system of governance and planning.

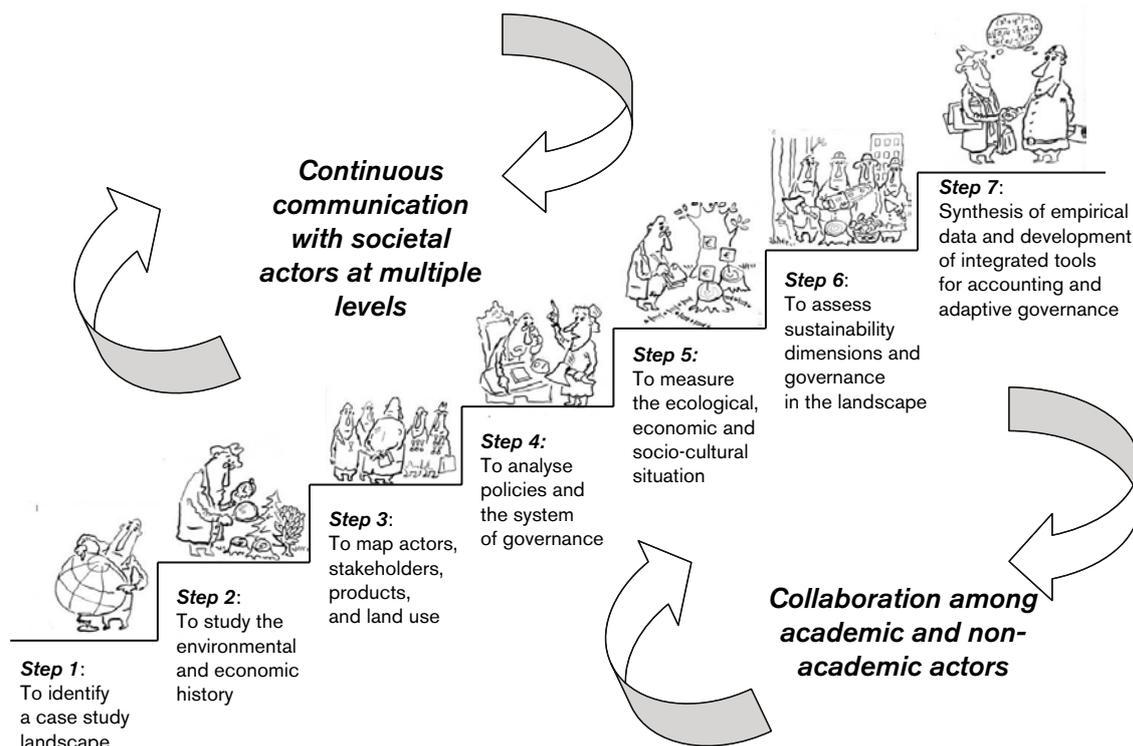


Figure 1. Illustration of a step-wise approach to knowledge production in support of the development of accounting systems for ecological, economic and socio-cultural dimensions of sustainability and adaptive governance. Drawings by Leonid Kovriga.

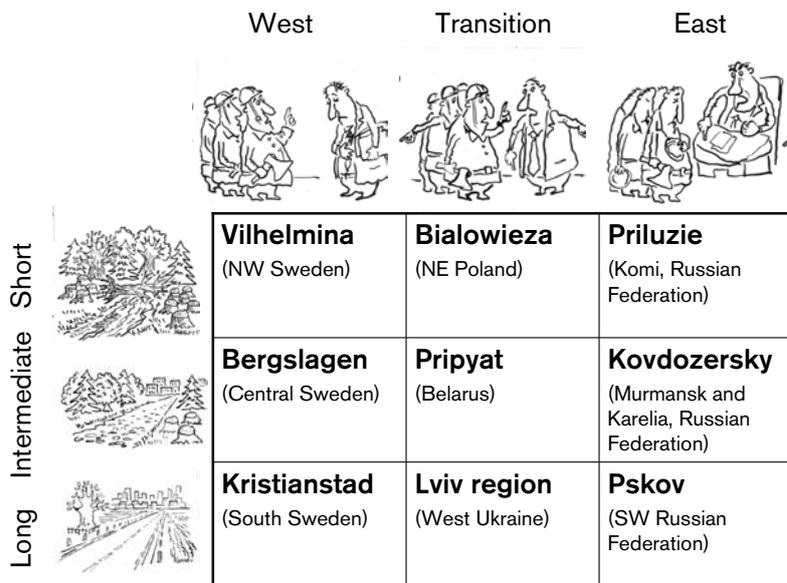


Figure 2. Case studies, distributed according to economic history (as rows) and governance (as columns). See front page map for location of case studies. Drawings by Leonid Kovriga.

The suite of case studies aims at reflecting the range of variation of European boreal and mountain forest landscapes. To assure involvement of non-academic users we focus on selecting case studies that represent regional centres of interest (Figure 2).

### Step 2. To study the environmental and economic history

Landscapes have been shaped by different natural and cultural disturbance regimes, with different intensities and over different time spans. To understand the prerequisites for sustainable forest landscape development, the ecological, economic and socio-cultural history of forest landscapes is analysed in order to understand the consequences of past human influence on the landscape.

### Step 3. To map actors, stakeholders, products, and land use

To understand ecological, economic and socio-cultural dimensions and the governance system, it is important to consider all actors and stakeholders involved in the use and management of a forest landscape and in different development and planning processes. This involves multiple levels, from local and regional to national and global. Several sub-steps should be taken:

- map all forest actors and stakeholders and group them into different categories.

- describe the products they deliver using quantitative data and estimate the total economic value.
- identify property right structure.
- identify the types of land use related to the production of the desired goods and services, the including use-rights to understand what kinds of interest that are connected with the particular landscape.
- evaluate the potential impact of land users on land cover in the future.

### Step 4. To analyse institutions, policy visions and the system of governance

The implementation of sustainability policies requires understanding of the institutions, i.e. rules and norms in use, policy visions, and collaboration among many actors at multiple levels with different interests and agendas within a landscape or a region. A critical issue is to understand the policy visions for sustainability. Such “benchmarks of sustainability” are derived from analyses of policy documents and interviews with representative forest actors and stakeholders. This vision can then be used to define the “reference landscape” for different dimensions of sustainability. The evaluation of the policy cycle concerns how policy is formulated, analyses of policy contents and the level of consistency and integration among sectors and levels, how policies are translated into regulations, and how these are communicated and implemented in a defined forest

landscape. Actors and organisations implementing policies in a forest landscape and affected actors and organisations should be studied to evaluate their understanding of policies, ability to act and attitudes. In this way gaps in forest policy creation and implementation in the case study landscape can be understood.

### Step 5. To measure the ecological, economic, and socio-cultural situation

The aim of this step is to measure the ecological, economic, social and cultural state of the selected forest landscape. Additionally, changes occurring in the case studies, including the resulting changes in biodiversity, land use, social interactions, and cultural dimensions are studied. Equally significant for evaluations are modifications in the governance system at multiple levels that affect both the investigated landscapes and their surroundings.

### Step 6. To assess sustainability dimensions and governance, and to make scenarios

Apart from dividing the sustainability concept into different criteria and indicators, it is necessary to compare the state and trends of indicators with performance targets representing the sustainable and preferred states as defined in step 4. Defining the acceptable habitat loss for biodiversity maintenance is one example. Knowledge about the critical habitat loss allows evaluation of the past and present impact of land use in the landscapes. Examples of appropriate tools for evaluation of ecological sustainability are regional gap analysis and habitat suitability modelling for landscape planning. Using the information on current land cover trends and the future actors’ interests, landscape structure can be modelled based on scenarios for future development of governance, including uncertainties and climate change. The results of assessments and scenarios should be communicated in the decision-making process at strategic, tactical and operational levels.

### Step 7. Synthesis and development of integrated tools

Once the six previous steps have been replicated in a sample of case studies, best practices can be identified and scaled up. Ultimately, accounting systems for sustainability and arena concepts for adaptive governance can be developed. Data on indicators for different criteria and knowledge of associated performance targets allow assessing the level of dif-

ferent dimensions of sustainability. This information forms the base for transparent communication of the state and trends of sustainability dimensions among decision-makers and stakeholders at multiple levels, and to the general public through different media.

### **A platform for transdisciplinary knowledge production**

To realise the vision of sustainable forest management requires new knowledge and dissemination of experiences representing both development successes and failures. During the past decade a large number of initiatives have been initiated and new approaches tried. However, by and large this knowledge is context-specific, and exchange of experiences among regions and sectors is limited. To extract useful new knowledge from a sample of case studies, a transdisciplinary approach is needed where researchers from different disciplines work together with representative local and national actors and stakeholders. This brings new challenges to researchers, their networks, academia, and donors as well as to all other involved actors and stakeholders. In spite of this, to solve major sustainability issues we truly believe that this is the way to go.

### **Keywords**

Sustainable forest management, landscape governance, forest policy, land use

### **Read more**

- Angelstam, P. & Elbakidze, M. 2006. Sustainable forest management in Europe's East and West: trajectories of development and the role of traditional knowledge. In: Parrotta, J., Agnoletti, M. & Johan, E. (Eds.), *Cultural heritage and sustainable forest management: the role of traditional knowledge*. MCPFE Proceedings, part 2, 353–361.
- Angelstam, P., Kopylova, E., Korn, H., Lazdinis, M., Sayer, J.A., Teplyakov, V. & Törnblom, J. 2005. Changing forest values in Europe. In: Sayer, J.A. & Maginnis, S. (Eds.) *Forests in landscapes. Ecosystem approaches to sustainability*. Earthscan, pp. 59–74.
- Angelstam, P. & Törnblom, J. 2004. Maintaining forest biodiversity in actual landscapes – European gradients in history and governance systems as a “landscape lab”. In: Marchetti, M. (Ed.) *Monitoring and indicators of forest biodiversity in Europe – from ideas to operationality*. EFI symposium No. 51, pp. 299–313.
- Axelsson, R. & Angelstam, P. 2006. Biosphere Reserve and Model Forest: a study of two concepts for integrated natural resource management. In: *Science for Sustainable Development – Starting Points and Critical Reflections*, Conference on Science for Sustainable Development, Västerås, Sweden 12–14 April, 2005.
- Elbakidze, M. & Angelstam, P. 2007. Implementing sustainable forest management in Ukraine's Carpathian Mountains: the role of traditional village systems. *Forest Ecology and Management* 249: 28–38.
- Elbakidze, M., Angelstam, P. & Axelsson, R. In press. Regional development towards sustainable forest management in Russian Federation: state and trends in Kovdozerskiy Model Forest in the Barents region. *Scandinavian Journal of Forest Research*.
- Lazdinis, M., Angelstam, P., Lazdinis, I. 2007. Maintenance of forest biodiversity in a Post-Soviet governance model: perceptions by local actors in Lithuania. *Environmental Management* 40:20–33.
- Lazdinis, M., Angelstam, P. 2005. Functionality of riparian forest ecotones in the context of former Soviet Union and Swedish forest management histories. – *Forest Policy and Economics* 7(3): 321–332.

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