

# Searching for the Magnificent Mountain Landscape; Environmental management in the Swedish mountain area

Ingrid Stjernquist<sup>1</sup>, Harald U. Sverdrup<sup>1,2</sup>, Peter Schlyter<sup>1</sup>, Salim Belyazid<sup>2</sup>, Deniz Koca<sup>2</sup>,  
Ulrika Jönsson-Belyazid<sup>2</sup>

1. Environmental and Resource Dynamics Group,  
Dept. of Physical Geography and Quaternary Geology, Stockholm University,  
SE-106 91 Stockholm, Sweden

2. Applied Systems Analysis Group,  
Chemical Engineering, Lund University, Box 124, SE-221 00 Lund, Sweden

## **Background**

To reach a sustainable society where the environmental problems are solved, Sweden has formulated 16 Parliamentary Environmental Objectives (Environmental Objectives Portal 2011). The basis for these new modes of governance is that sectors and stakeholders must take more responsibility for reaching the national environmental targets. However, problems with an objective oriented environmental management of complex issues are that the objective is often vaguely defined and is hard to down-scale to the regional and local level. The need to develop management tools for complex systems initiated a project to map structures and interactions between stakeholders and to analyse how processes within the objective frame influence the management ability. The project used the environmental objective “A Magnificent Mountain Landscape” (MML) as a case.

## **Aim**

The aim of the project was to map structures and interactions between different stakeholders and interest groups in the Swedish mountain region and to analyse how processes within the mountain landscapes influences the management of these areas as well as the ability to reach the Swedish parliamentary environmental objectives, mainly the Magnificent Mountain Landscape objective.

## **Methods**

The project used systems analysis and group based conceptual modelling included a social adaptive learning process to examine the management of the environmental

objectives, including sub-objectives, and the extent to which they contribute to achieving these objectives. Group based conceptual modelling provided the foundation for the analysis presented as causal loop diagrams to map major relationships. The diagrams were continuously and collectively peer-reviewed allowing all stakeholder attitudes to be obvious for the participants. The study uses the generic systems dynamics procedure (Vennix et al., 1992, Sterman, 2000, Haraldsson & Sverdrup, 2004), the learning loop (Haraldsson 2005) and group modelling (Vennix et al., 1992, Maani & Cavana, 2000)

The research process involved 40 stakeholder representatives interacting over seven workshops. The stakeholders represented all kind of actors from The Swedish Society for Nature Conservation to the Swedish National Grid, from small scale farmers organisation to the tourism organisations. The authorities active in the areas also participated as well as representatives for the Sami people, municipalities and researchers.

At the beginning of the process, all participants took part in a general group modelling focusing on the definition of the "Magnificent Mountain Landscape" objective and the identification of activities of relevance for the objective. Secondly a systems analysis of the identified sub-systems, i.e scooter traffic, tourism, energy and mining industry, forestry and agriculture took place. The forestry and agriculture session also included traditional grazing strategies, hunting and fishing. Group modelling of the mountain area in relation to the cultural identity of the Sami people as well as a separat session for public administration, power and strategic planning were later included. Thirdly, the sub-systems were pooled together to analyse how these were connected and how they influenced the management of the mountain area and the ability to reach the environmental objectives.

## **Results**

The main finding was that the current focus of the MML objective on environmental sustainability was too narrow and that a broader perspective including social and economic sustainability was needed, Fig 1. Chosen indicators are not sufficiently comprehensive and only partially indicating if the objective is reached and the process of public participation has been dysfunctional. The current management lack respect for local

perspectives and the locally perceived legitimacy of authorities is low due to previous actions and experiences. Stakeholders and actors identified the need for further multidisciplinary research including stakeholders and landowners in the area and focus on all aspects of sustainable development.

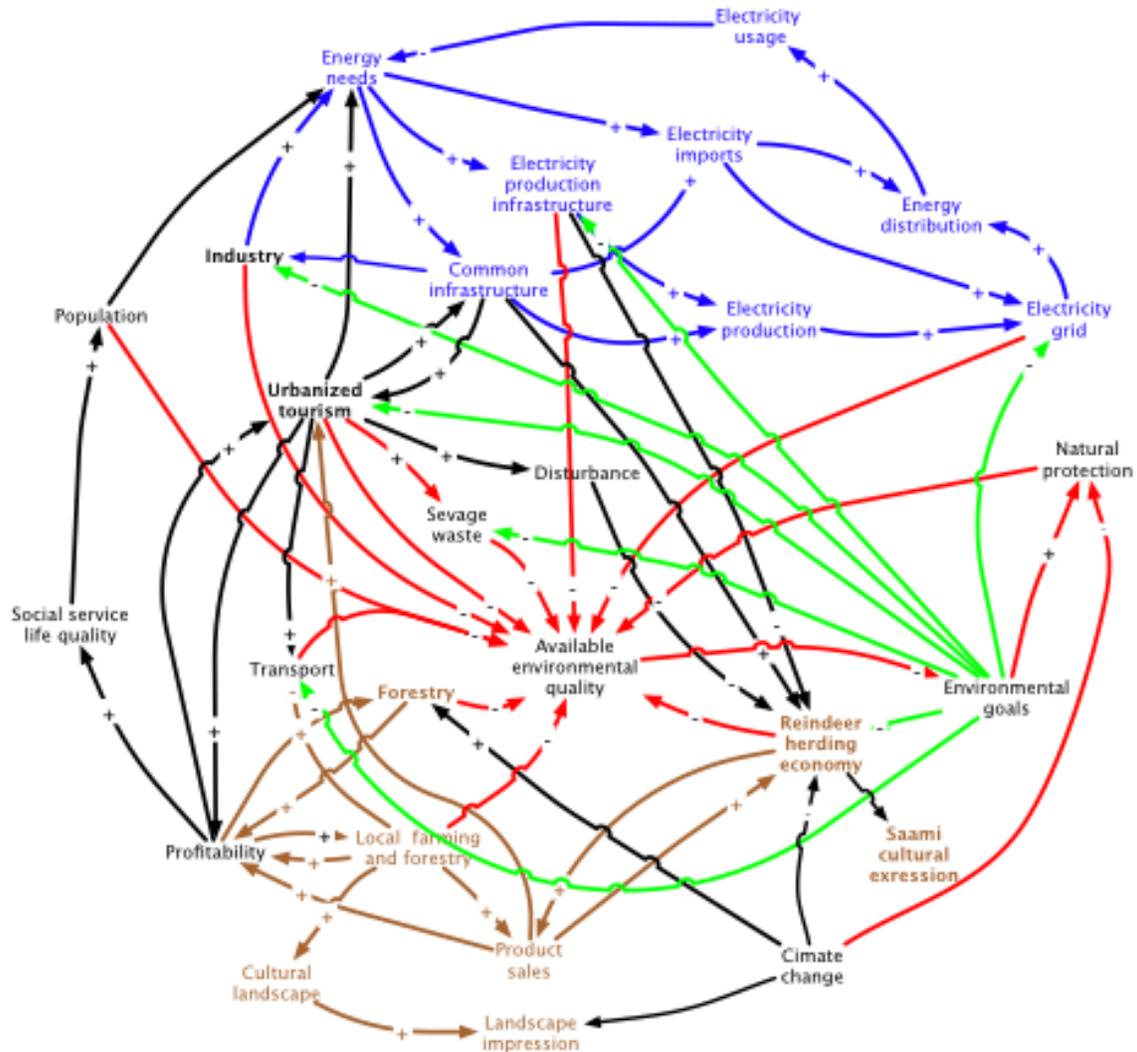


Fig. 1. A sustainable use of the mountain area needs a balance between ecological, economic and social perspectives. The figure show a simplified picture of the most important relationships, combining the sub-systems of environmental targets (red), tourism and social services (black), energy and industry production (blue) and forest and agriculture (brown).

## **Conclusions**

Based on the group modelling sessions the following requirements for a successful environmental management were identified:

1. The environmental objectives is rather abstractly frased and the associated sub-objectives are not adequate and difficult to operationalise.
2. The sub-objectives take no account of geographical scale, regional differences or trans-boundary impacts. The sub-objectives needs to be redefined in order to be able to differentiates between:
  - i Causes
  - ii System states
  - ii indicators for invironmentaql imrovements
3. The timeframe is insufficiently defined with regard to stated long-term and short-term objectives
4. Chosen indicators are not suffiently comprehensive nor well received and only partially indicating weather the objectives are reached or not. The indicators are too weak to catch process drivers, which makes them har dto use for prognosis or scenario work.
5. The sub-objectives are not in a clear way related to the wider sustainability objectives (Sverdrup & Stjernquist 2002). Neither has the long-term sustainability of the sub-objectives as such been assessed and the social aspects are poorly studied and underdeveloped.
6. There are two types of problems related to the environmental objectives that need to be surmounted:
  - i Issues of technical-scientific character associated to how the state-of-knowledge is transformed to relevant objectives
  - ii Issues of social character associated to problems at the interface between local communities and central/regional authorities

## **References**

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