CHRONICLE

Sustainable Forestry in Temperate Regions SUFOR International Workshop, Lund, Sweden

SUFOR is an eight years interdisciplinary research programme on sustainable forestry in southern Sweden ranging various considerations and offering possibilities for the future silviculture to become well thought-out taking into consideration economical as well as biological and social aspects. SUFOR programme director Prof. Bengt Nihlgård (Lund University, Sweden) marked that the Environmental Strategic Foundation MISTRA, which based in Stockholm, funds this programme as all long-term programmes directed Integrated Research Programmes. Such programmes aim to find solutions important for a society, its economy, people and the environment. The SUFOR embraces three universities and some separate institutes. The programme has engaged about 40 scientists and will bring forward in total about 15 PhD-students.

The objective of this programme is to provide scientific basis for achieving an economically viable forestry with long-term forest health while maintaining biodiversity and the multiple use potential of the forest. The SUFOR is important to solve the problems discovered in Swedish forests during the last few decades. As Prof. Bengt Nihlgård has noticed, the important theme for the SUFOR is to understand the long-term effects on soil, water and productivity of forests, including economy, by the continuous deposition of the acid rain and nitrogen in combination with harvests, and to recommend measures and solutions for the forest owners. If nature should be considered stable in a long-term perspective, then the forest soils principally should retain their chemistry in order to produce runoff water with acceptable quality. Negative variables counteracting this goal are the sulphur and nitrogen deposition, and high production followed by harvest.

One of the hypotheses within the SUFOR is that the amount of deciduous trees in south Swedish forests should increase while deciduous trees become very old. A great part of the biodiversity of southern Sweden is connected with deciduous trees. Deciduous trees increase the recreational value as well as they adorn the landscape. Furthermore, deciduous trees are more resistant to the strong wind and the root rot, and they may possibly improve the nutrient status of the forest soil. Some of the problems are visible damages on the growing trees such as the defoliation and other changes in crown condition, the resin flow and the oak damage. Other problem is the decrease of biodiversity in managed forests as well as the reduced forest soil fertility. It is suggested that acidification, nitrogen deposition and an intensified silviculture should increase the risk of soil nutrient imbalance, which may deplete the forest soils. The ground level ozone and climate change may also have negative effects on the forests. The international goal on the maintaining biodiversity has caused discussion on solutions especially in Southern Sweden, where mostly private forest owners manage the forests. That formed other important theme in the SUFOR aiming to identify solutions that can meet the demands for biodiversity, simultaneously as an economic output is realistic for the landowner. Forestry production must be economically beneficial at the same time as forest health, forest soil fertility and biodiversity are preserved, combined with an increased consideration of the multiple use of forests including recreation, hunting, outdoor living, berry picking etc. All mentioned aspects have been in focus for models and field research during the five years of the SUFOR. Research was organized in three research areas. Each area contained several research projects. There is the first research area *"Management and society"* including projects *Systems for production and multiple use planning, Risk estimates, Strategies for social analyses and economy, Strategies for forestry measures, Strategies for water runoff, Water runoff areas, System co-ordination, Regional preservation of biodiversity, Scenario analyses including elemental budgets for forest soils;* the second research area *"Prognoses and systems"* including projects *Integration of models, Mapping of potential harvest of biomass on different scales, Integration of game browsing, tree regeneration and biodiversity, Regeneration models, Stress modelling, Ozone stress model,* and *Synthetic work, model co-ordination and documentation*; as well as the third research area *"Processes and mechanisms"* including projects *Biodiversity model at the landscape level, Competition strategies of mixed forests, Wood production in mixed*

forests, Nutritional needs of different tree species, The root system efficiency - features, dynamics and strategies, Validation of historical information, Validation of dead wood components, and *Validation of threatened species dispersal at the landscape level.*

At present, the SUFOR has finished its fifth year. Prof. Bengt Nihlgård noted that a number of results caused intensive debate among scientists and also some hesitation among foresters about what is the optimal solution for forestry in Southern Sweden. It was considered within the SUFOR the current situation not sustainable. It is question whether forest productivity will decrease or forest damage increase due to this instability in the long run. Will recreation desires from society take over in importance for the South Swedish forests? How can the economy be solved for forest owners?

On April 7-9, 2002 the SUFOR has been organized an international workshop "*Sustainable Forestry in Temperate Regions*". The workshop has been held at the Lund University in Sweden. The workshop programme encompassed the keynote reports, oral and poster presentations in three parallel sessions such as *Nutrient sustainability, Restoration of biodiversity* and *Forest Resource Management* as well as three parallel workshops that deal with the key discussion topics. The constructive aspects, which can be found in the following contributions, were collected. According to the concluding remarks by Prof. Bengt Nihlgård, a number of questions were raised around mentioned items on different occasions. The first subject on "*Nutrient sustainability*" was considered as linked to soil acidification and acid rain, nitrogen fertilization and tree growth, and different problems linked to soil deterioration. The conclusions were that long-term productivity couldn't be retained at the today level for many reasons if it should be combined with simultaneous maintaining of water quality and a high biodiversity. The possibilities of accepting lower tree growth, changing tree species composition into mixed stands, and using more deciduous in order to make better use of the soil weathering capacity for the root systems were identified. Deciduous trees seem to act on a larger root volume and increases sustainability, and climate change will increase the demand for using different tree species. Whole tree harvesting for bioenergy purposes was considered to demand nutrient return. The scientific contribution should be laid on basic understanding of the natural processes linked to production.

The second subject under consideration was "*Restoration of biodiversity*". It is concluded that the European landscape today misses a lot of old trees and of dead wood was obvious. A consistent management may support the existence of these. Fire and prescribed burning in the managed forest landscape was a hot subject. It was suggested that it should be additionally used for the same purpose, to increase the amount of dead wood, positive for biodiversity. However, many forests are continuously increasing biomass, thereby increasing the potential risk for natural fires, and there was a general agreement that areas exposed to natural fires should be saved, without cutting down trees. Also, saving deciduous old trees for natural dieback was stressed. For science the understanding of natural processes and the importance of constructing different models for forestry solutions was pointed out.

The third subject under consideration was "*Forest Resource Management*". There are different options trying to solve the problems of maintaining high production simultaneously with sustaining soil, water, nutrients and biodiversity conditions, were discussed. The solution was looked upon as an evaluation of risks for the forest owner; judgement of the risk for economic failures in using high production, the effect of much wildlife, the problem of sustaining the soil and water nutritional capacity, and simultaneously considering the social demands from society. It was emphasized that increased legislation was not the optimal solution, and instead more extended information on forest policy issues and possibilities should be encouraged. The scientific contribution is to show the thresholds, present prognoses and different options for forest owners, authorities and general public.

The papers presented at the workshop have been published as full-length papers in the Lund University Reports series "Reports in Ecology and Environmental Engineering", 2002, 1: *Sustainable Forestry in Temperate Regions. Proceedings of the SUFOR International Workshop, April 7-9, 2002 in Lund, Sweden.*

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