Policy Issues in Forestry and Timber Markets

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Mr. President,
most honoured academicians,

In the speech I will address main themes as developments and policies in the fields of forestry and forest product markets, recycling, wood-based energy and environmental considerations and the interactions between them.

The speech will be an overview of the current trends and tools to integrate the environment in the forestry and timber industry sector.

Background-problems of giving prognoses for the future

Forestry in most part of Europe has one main disadvantage compared to agriculture: it takes a long time for a forest stand to grow up and become profitable, at least 50 years, and normally 70-120 years. It means that today we should know a lot of the future in planning for the future forestry. However, there are very few things about the future on which we can be sure. The most obvious thing is that we will never be able to give correct prognoses of even the next ten years! Very few forestry prognoses so far presented have shown to be correct even in a short term perspective, i.e. for a 10-20 years period. I will present my doubt that it would be easier today. On the contrary I believe that our today prognoses will meet with so many unexpected obstacles and misjudgements that we will be happy if we can manage to be correct in 10% of our prognoses.

Let me give you *two examples on the problems of prognoses*

1. In the end of the 19th century Swedish authorities strongly recommended plantation of forests, as we were almost run out of wood in the whole Southern part of Sweden. Very few woods and forests existed at that time. The recommendation to plant spruce and pine was followed, but with large resistance from land owners and communities asking for economic support. Nobody at that time probably believed that 100 years later we would have more forests in Sweden than we ever had over the last 500 years.

The explanation was above all that in agriculture we learned how to use nitrogen and mineral fertilizers, and instead from wood the energy was taken from fossil oil and coal, the "new" profitable energy sources. There was then no obvious use of the land for agricultural purposes, and forests were coming back naturally by itself or by plantation. This development was impossible to foresee!

2. In the 1970s there was a large evaluation of the Swedish forestry and its economy, and it was clearly stated that the forest industry was facing a period of deficiency of wood after only 10-20 years. Such a development would be serious to Swedens economy. Strong recommendations on how to rationalize forestry and increase the forest area were worked out and distributed. A new forestry law was enacted which strongly subsidized forest owners who wanted to make new forest land, ditch mires, plant forests, build forest roads etc. The result was astonishing; the forested area enlarged slightly, but simultaneously the forest growth per hectare increased 30-50% as compared to that in 1950! Today we have forest growth of more than 100 million cubic metres per year, and we make use of only 70% of this growth. This can not be explained by the recommendations and subsidies only. How did this misjudgement come in the 1970s?

On the explanation is that the increased nitrogen deposition has helped increase forest growth throughout Sweden, and mostly in southern Sweden. Another explanation is that the forest industry did not increase as much as was planned, mainly due to increased competition from abroad.

The fossil energy

There is one important lesson I would like to highlight as the background cause for the development of these two examples: the most important factor for mak-

ing both the misjudgments seems to be that we have started to make use of incredible, and still increasing, amounts of non-sustainable energy! During the end of the 19th century we learned how to make use of fertilizers, mainly nitrogen, using enormous amounts of fossil energy, and during the coming decades we used bigger and bigger machines, with large energy demands for construction as well as for driving.

Over the last 50 years we have increased the nitrogen emissions and the depositions of ammonium and nitrate so much that they obviously affect the forestry production, and the most important reason for these emissions and depositions is the increased and wasteful use of fossil energy!

This in fact means that we are building our society, our economy and to a large extent also our forestry methods, on a market that is totally dependent on non-sustainable fossil fuels for energy supply. As energy will be needed in some form also in 50-100 years, I think that forests will be an important and sustainable part in new energy policies all over the world, which makes the prognoses for the future even more difficult. Which species are best for energy purpose? It is certainly not the most volume productive trees, but instead trees with high wood density and high energy content.

Coal, oil, gas and peat are energy sources that today are so intensively coupled with the industrial world that it seems almost impossible to avoid using them if we want to retain the standard of living we have been used to. However, I think we have to listen much more to those scientists pointing out all the principle negative effects connected to the use of fossil fuels. We have to pay for all the negative effects that pollutants of the fossil fuels will cause in nature and to our societies. This is indeed a remarkable situation, guided by the market and by the lack of international understanding or legislation that counteract a reckless burning of fossil fuels.

New problems for the future

During the last decades a number of new environmental and market problems can be observed. They might be of extraordinary importance for forestry in the future, if the problems will show to be durable, constant and/or increasing in complexity, and if the relations to forest growth will be shown to be correct. In the following I will discuss these items and give my judgements as to what extent forestry of today has to plan for them.

1. NGO's environmental demands and restrictions for forestry

Today voices coming from organizations interested in supporting a long-term sustainable society become stronger and more important as they directly affect the market. Besides a number of general environmental restrictions concerning the use of toxics and the emissions of negative fuel gases, the requests concerning forestry are directed towards a sustainable forestry, thinking above all on *sustainable energy use*, retaining of *nutrient balances and healthy trees*, and retaining of *biodiversity*.

To handle our heritage responsibly means an environment awareness directly related to the quality of life. A culture can never select its way over nature. Albert Einstein states that respect for nature and mankind should always be the target for all technical progress. The famous botanist Carl von Linné writes more than 200 years ago in his "The Wonder of Nature" that the nature of matters does not at once reveal its secret; we consider us informed but we are only in the fore-court.

By advancing knowledge through research efforts and international cooperation we have to realize that continued economic growth is possible to achieve in harmony with the cycle of nature. The driving force behind economic growth is new technology. Possibilities to reduce consumption of limited resources are thereby created. At the same time, however, there are risks for change in the process of evolution. But, the new concept considers an awareness that the threats in the development of the society tie the global economy and global ecology and energy aspects and policies together.

- **Energy** is used for construction and driving all needed machinery in a rational forestry. The demands from NGO are that bioenergy or other sustainable energy sources, should be the basis for producing the machines, and they should be driven by vegetative oils and petrol. The total transports of machineries, products and people should be as low as possible. From the material point of view the recycling of machinery material must increase.

A change in the energy system for many countries is with a long term view necessary and has to be achieved in an economically wise manner. It is a necessity to find sustainable solutions where environmental strategies are integrated parts of overall policies. The only way is to reduce the use of fossil fuels. Bioenergy fuels should be given an increased role in the energy supply and through methanol and ethanol in the fuel need within the transport sector.

My country is an example, where bioenergy has taken an important part of the energy production for heat purposes. The cost efficiency has developed to a profitable level, thereby opening a new market for forestry. Rawmaterial is taken from harvest residuals, thinning operations or special bioenergy forests.

Research and development attention is devoted to the possibility to increase the yield of electricity from bioenergy. This is needed to make such a process economically acceptable.

In my judgement industrial use of bioenergy on a global scale offers an interesting possibility for forest trade where environmental considerations really are integrated in future policy issues.

A life cycle analysis surely should convince about the value of such a strategic direction of future forest trade.

- **Mineral nutrients and nitrogen** taken from the forest soils. The today are needed for producing wood deposition of nitrogen, however, is higher than the weathering of proportional amounts of minerals of the soils, and slow but successive depletion of the nutritional balances in the forests seems to go on. The demands from NGOs are that what is taken out from forests should be returned in proportions, and this asks for recirculation of clean woods ash and other waste materials, i.e. without accumulating toxic heavy metals or organic toxic, from industry and society. This may be called vitalization fertilization, but should more correct be termed a *mineral balanced forestry*.

- When we use forests for wood harvesting it is almost inevitable to affect the **populations of other organisms** than trees. Today, it is absolutely demand from NGOs that we can show that forestry may retain biodiversity in the landscape and/or in stands. The demands are not that every square meter should be saved for the future, but that restrictions in forestry are high enough to ensure that the existing biodiversity will be retained or increased on a landscape level. From a forestry point of view this asks for a planning area of about 100 ha or smaller. There is a number of possible ways of handling this environmental challenge, and I will not go in details here. Important methods are that we leave *more dead wood* in the forests, that some *"eternal" trees* are left forever for free development, and that some smaller *valuable habitats with high biodiversity* in the forested area are almost completely free from forestry.

We all know that the society and the whole globe today are exposed to a number of fast changing factors. Forestry has to face this situation and basic ecological principles must guide even in a troublesome world. Most countries of the world have in fact signed the Rio de Janeiro declaration of 1992 concerning sustainability of forests based on ecological principles, and increasing research in this field evolves in Europe. As an example of implementation the new forest policy of Sweden states two equal goals in forestry; forest environment and forest production. In my consideration, some of the following policies are likely to be of leading importance in the international arena in years to come:

- The production of forest land shall be preserved.
- Biodiversity and genetic variation in the forests shall be secured.
- Forest must be maintained so that plant and animal species which exist naturally in the forest ecosystems can survive under natural conditions and in vigorous populations.
- The historical, aesthetic and social values of the forest must be defended.
- Forests and forest land shall be utilized efficiently, aiming at a sustainable and valuable yield.
- The composition of the forest production must be such that it has a potential to satisfy different human needs in the future.

For the forest owner such policy issues mean a great possibility but also a significant responsibility.

2. Long-term climate change

The increase in carbon dioxide in the atmosphere, in combination with other greenhouse gases, is shown to cause a general heating of the Earth. Today the scientific agreement on this matter is 100%. However, the many different processes on the Earth that react on heating entails difficulties in predicting how different regions will be affected in detail. It is most likely that the next hundred years on average will be warmer, about 2-3°C, but in northern Europe this perhaps will not come true if the Gulf Stream is negatively affected. It might even be colder! If it will be warmer, then a number of deciduous trees would be best adapted far north in the Nordic countries, and the coniferous trees, especially Norway spruce, will have a hard future here. Foresters must be wise enough to plan for this future, and my recommendation is to make use of many different tree species, which should be a certain insurance for the future. Also, to make more use of natural regeneration might be one way of finding a slow adaptation to changed climate in any direction.

3. Effects of air pollutants

During the last decades it is observed an eutrophication of the terrestrial environment, in combination with increased soil acidification. This is due mainly to increased nitrogen accumulation in the forests, and its ecological consequences what concerns nutrient balances, soil acidification and forest health must be treated with caution in forestry. Even though all efforts must be made to decrease the nitrogen emissions in the environment, foresters must carefully observe the forest health status, the soil acidification and the nutritional imbalances that inevitably will follow. In many ways these processes are very similar to agriculture, and will call for similar counter measures to find mineral balanced forestry. A secondary negative effect that might follow is a decrease in forest health, and increased nitrogen leaching to the ground water. A forestry with trees in bad condition, and with stands that cannot show a balanced nitrogen cycle will probably not be adapted as a sustainable forestry.

The production increase, that is measured in the whole Europe during the last decades, has a positive effect on the carbon dioxide level in the atmosphere. In forest soils an increasing amount of carbon is stored as litter and undecomposed organic matter, which in a short term perspective might be important for balancing the carbon dioxide coming from fossil fuel burning. This should be a plus for sustainable forestry at the beginning, but it is not likely that this accumulation will last forever. Instead it probably will show up that it is necessary in a long-term perspective to have a balanced and stable situation.

Among other air pollutants we must also be aware of the still existing negative ozone effects in the troposphere, arising all over Europe and in all regions emitting nitrogen oxides and evaporated organics to the atmosphere. The restrictions that must come to avoid the ozone peaks are so strong that we in practice must calculate to live with increased ozone levels for many decades ahead. In forestry this will ask for restrictions with nitrogen oxide emissions, especially from motor vehicles, and we should know more about the ecology of tree species that are especially sensitive for long-term exposure to high ozone levels.

Thus, we are dealing with chemical stress factors which in complicated mechanisms cause disturbances in ecosystems. Forests are damaged on vast areas. The growth rate of our forests in a longer perspective might be affected. It is fortunately true that awareness and knowledge about the effect and extent of damage of air pollutants have improved with representatives for science, industry and politics. This is true also in an international sense. Many organizations are active in solving this problem from different aspects. No doubt, the elimination of the problem means a complete control program of emissions from different sources of sulphur dioxide, nitrogen oxides and hydro-carbons, with a concept based on the principle of critical loads.

The nature of biological science is no doubt such that links and mechanisms of the kind involved here can scarcely be clarified with 100% certainty. Research and counter-measures in terms of emission control and management must, therefore, proceed in parallel. International cooperation is fundamental.

Basic risk-management thinking should be adopted also to environmental matters. Forestry and industry must deal with forest decline as a potential risk or threat and not just something that might interfere some times on the markets, something only for environmentalists, politicians and scientists. In that respect I would like to underline the importance of functioning process of knowledge transfer between the representatives of science, industry, forestry and politics. Messages are not always understood, demands and questions are not always phrased precisely enough. The process must be intensive, open and correct. International agreements - such as emission control programs - have to be locally accepted. In a situation where the local strategies are not effective or significant, even the best international intentions are not likely to function.

4. The future market

Forestry cannot exist without a market that calls for timber, paper pulp and bioenergy. In the future building with timber and the market for wood furniture will probably not decrease, nor will the need of paper pulp. It is, however, quite clear that if human beings would stay on Earth in a very long-term perspective we have to change our energy habits, and move over to sustainable and renewable energy forms. In many countries these requests would lead to the use of much more bioenergy, and forests are no doubt the most energy efficient ecosystem we have on the Earth, calculated as a total energy budget on the production. Obviously we have a possibility to increase the energy use from forests, and there should be a large market for production of special bioenergy forests that make use of all the nutrient rich waste products that we today emit into

rivers and oceans or deposit in large deposits in soil or coastal areas. My judgement is that this is one of the most challenging fields for the future in forestry, and there is a need for a great amount of research, as this energy forestry with recycling minerals should become reality in a near future.

Timber industry strategies

It is my firm believe that the solid wood and pulp and paper sector in its development of worldwide strategies has to consider and accept influence from the new problems and trends I have tried to communicate.

A basic advantage of timber products in that sense is wood as an environmentally friendly material. The energy demand in handling and conversion is very low in comparison with that of the most important non-wood substitutes in building trade, concrete, brick, steel, PVC and aluminium. In the discussions to increase timber market shares that should be emphasized much more.

In accordance with the possible future concept it is important to work in the total business system from forest to end-consumer, to create an integrated system from customer to tree. This runs parallel to structural changes in the marketing and distribution of wood products.

The progression from supplying local markets to supplying regional, national or global markets will have long term implications on the wood working industry.

This opening up of markets will lead to increased competition and changes in the structure of the wood working industry. These changes will serve to increase the level of sophistication of production, sales and distribution.

The industrial end-user will place increasing demands on the suppliers. Therefore, the supply will need to go beyond simply processing sawn wood. This change will be driven by a situation where industrial end-users will carry out as little as possible of the initial work-up of wood but will purchase adapted lumber, blanks or components from the suppliers. This will require the development of a closer working relationship between suppliers of wood and industrial end-users. To succeed, suppliers of sawn timber and composite products will need sales engineers as material consultants with know-how about the demands in specific segments of the industrial sector. This sector is growing, and with good reasons. It can create value through rationalizing the work on the building site.

A change in the purchasing patterns of industrial end-users from short term purchase of commodity grade products from many suppliers, towards the purchase of customers adapted products from fewer suppliers is evolving. End-user will demand a reliable, just in time service from its suppliers at competitive prices. Suppliers of wood products will have to provide a full assortment of wood-based products, to provide local distribution service with the capability to deliver directly to a number of individual outlets.

It is also important to realize the vital linkage between the solid wood and pulp and paper sector. Most pulp and paper operations are being called upon to make significant capital investments to meet new domestic and international environmental regulations and changing consumer preferences in key markets. These investments are often capital intensive.

Demand for recycled fibre content is increasing and will require investments in densely populated consumer areas where wastepaper collection costs are low.

Global trends in pulp and paper may be formulated as:

- increased globalization and consolidation
- increased demand from environmental considerations
- concentration among customers
- increased need for specialization
- scale more and more important regarding facilities
- increased demand on marketing and distribution
- increased demand on R&D

With the overall view I have applied the following global trends of importance may be summarized for the solid wood industry:

- customers in established markets get fewer and bigger
- distribution chain is flattening
- increased demand on customer adapted products
- increased need of wood-based families of products
- environmental aspects get more and more important
- more demand on R&D

The challenge ahead for wood products companies will therefore be to develop integrated market strategies of wood-based materials. Solid wood, composite products and engineered wood products make up a tool box which gives the customer a desired combination of wood-based materials.

To conclude

Let us remember the conditions for future forest trade,

- the rules of the game in the global forest products industry are written in the global market place,
- the only guarantee for export-dependent forest products countries haveregarding jobs and tax incomes is that they are globally competitive.

Wood as an environmentally friendly material, because of its renewability when grown and produced under sustainable forest management principles, and employed appropriately for its wide range of products and processes, and finally recycled or used for energy, should very actively be promoted through coordinated international efforts. Consumers need to be much better informed about the advantages of overall wood. Existing information on the use and reuse and recycling of wood and wood fibre, including energy production, needs to be disseminated internationally. Additional studies should be encouraged to promote wood as a renewable energy source.

It is obvious that the change and development of modern society lead to an increased burden and pressure upon the environment and thereby in the longer perspective also a threat on resources, upon which the development is dependent.

In my opinion the future welfare and development of the society on a global scale is dependent on a balanced progress of technique and technology, certainly a dynamic process. In order to read the potential changes in the surrounding world, to distinguish Strength factors of tomorrow from those of today, all technical development always has to be described with environmental consequences. This means a fundamental change of progress policies. With the Brundtland commission consider the needs and aspirations of the present generation without the ability of future generations to meet their own needs.

To fulfil that, most honoured academicians, is our responsibility in formulating future policy issues.

Note.

(Policies communicated also at ECE-workshop in Hamburg, September 3, 1996.)

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