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## Sustainable Forestry in a Sustainable World

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Survival is a fundamental issue to human beings, and also, to the social groups created by them, such as companies. Nowadays, due to population growth and globalization, survival is an art question to everybody.

Human beings are eccentric animals, who are motivated by two driving forces: requirements and benefits. All of them have requirements, some very basic, others more sophisticated. When fulfilled, they provide joy and happiness. This is one of the benefits, among many, that we look for. There is an old saying "necessity is the mother of invention". To fulfill his growing requirements, man activates his creativeness when searching solutions.

Until today, our happiness has been obtained thanks to the utilization of natural resources. This is understandable, since we are components of Nature. What is concerning us now is the future of the planet Earth. We suspect that Nature alone has no capacity to fulfill all human requirements, each day more consumerist. Today's logic is for consumption and wasting. More consumption, more waste (and vice-versa) and more active the economy is. It is a perverse model to Nature, but this is the model we have created and we are proud of it. To solve waste generation and disposal, we have created pollution abatement techniques, strict legislations, incentives to recycling, etc.

A similar logic of consumption of natural resources was followed in the past by the Mayas in Mexico. Mayas were dependent on a very fragile ecosystem to supply their needs. Until now, we have doubts about why the large Maya's cities were abandoned by the population. The belief is that Nature was no longer able to provide their needs for wood and food.

Man is a very perfect machine, but has low quality sensorial devices. We are not very sensitive to hear, to see, to tact and so on. This makes us slow to react to natural stimulus.

Today, we have more sophisticated equipment developed with the aim to help our sensitiveness to go deeper. Thus, we are improving our ability to understand our environmental impacts. One of the goals we wish by improving our senses is to be able to better predict the future. In the past, due to his ignorance, man's belief was that the future was in God's hands. There was nothing to do except to wait for things to happen. In this century, as never before, man discovered he was able to create his own future. As a consequence, many changes happened due to the cultural, agricultural, industrial, technological and information revolutions. Changes are becoming more frequent and sharper. Prediction of the future is each day more difficult and we need more indicators to do such. What we must understand is that changes always happened in Nature. Nature has never been in balance. Since the Big Bang, the Universe is changing and in continuous expansion. In his early days, man faced many challenges and helped to change the appearance of the planet. This makes me believe that the word *sustainability* is not so appropriate. It will be difficult to sustain, to maintain Nature as it is now. To save natural parks and to protect some endangered species are good measures, but they are no solutions, only mitigation. What is necessary is to break today's logic of no respect, no dialogue and no perception of the natural things. We know that natural equilibrium only exists in a short life time. Nature is always changing. During some short time it maintains itself in equilibrium, saving energy for another great change. In Nature, we always have one species eating another one or acting as a predator. Also, a natural disaster is always happening somewhere. This is the natural logic we have to understand to try to predict the future, now with more accurate and precise monitoring equipment.

In short, we do make a difference, sometimes small and going to the Nature's accumulator of

small changes, sometimes great enough to generate a sharp move.

Today, we are a population of 6 billion inhabitants, each one cooperating to raise energy for great changes. Keeping today's population growth rate, we may be the double by 2050. There is an estimate that the world's population will raise the peak in about 100 years, reaching between 15 and 20 billion people. Geographical frontiers are falling apart, the world starts to become small. Globalization is an example of this trend. Globalization also means economical, environmental and social impacts. Globalization goals are to be more competitive, reducing prices, to offer products everywhere (large markets). Environmentally speaking, this system is more energy consuming and brings strong social effects, mainly to the losers of the competition game. Globalization has an impact mainly in the scale of production: what is big has to become bigger and bigger to reduce costs. Naturally, the consequences are a concentration of demands and a reduction of job generation. More people means more demands to be fulfilled: more food, more energy, more wood, more treated water, etc. The model is concentrated, without a doubt. It may be perverse, unless we act in advance.

How to avoid this model bringing irreversible effects in the world forests? How to avoid agriculture replacing forest land to supply food to a growing population? How to provide food, energy, water, wood to the population with minimum environmental effects? As far as we have an enormous amount of technological and scientific information available nowadays, how to change production models in a creative and accepted way?

One thing is right: the next century man is not going to be happy having only basic requirements fulfilled. There are strong indicators proving that the aspects linked to happiness,

emotions, spirit, will be mostly valued. We are approaching an era of emotional rewards. Philosophy in opposition to machine rationality, feelings not only human's: these may become next century's values.

These indicators give to us the right to think that the new model will be based on the creation of things philosophically good and healthy, instead of acting to correct the bad effects of the large production systems.

What has been our attitude to this trend? Are we afraid of this new environment? What is the real meaning of sustainability? Are we able to define sustainability in a not so bureaucratic way? Shall sustainability be defined under an anthropocentric view? Or a holistic one? Is there a good definition of forestry sustainability? Is there only one way to make forestry sustainable? Shall different cultures, with different social values; have different definitions of the same subject? After all, until now we were not able to convince the British people to use the metric system or that they are driving in the wrong lane! Nor could we convince Americans that barbecue is not hamburgers with ketchup!

People are different and they have different and complex logic of thinking. For example, they eat a lot, but they want to become slim! Sometimes, they buy things, but throw them away without using them! Or they buy three times the same song (record, cassette and CD)!

Considering all these, we are sure that Nature alone will not be able to supply all wishes of this complex animal. We have to avoid exhaustion of the system, changing predatory and irrational ways of Nature consumption.

We know that biodiversity savings are essential. One lost species is the accumulated knowledge made by Nature thrown away with no chance for being rescued. Surely, there are areas to be protected: fragile ecosystems, areas rich on biodiversity, areas responsible for wa-

ter supply in watersheds, areas responsible for local micro-climates, etc. How much to protect depends on each case. There are no general rules. It is important to dialogue with the ecosystem to know it better and to see the corresponding effects.

Today we are living a promising moment in terms of changing the course. Forestry and environmental certification, although bureaucratic measures, are strong improvers for awareness in the field.

ISO 14000 implies better management attitudes, such as:

- a) following the corresponding legislation,
- b) evaluating environmental impacts and effects,
- c) having a continuous improvement program with targets and objectives clearly shared with the local community and third parties.

Also, the bridging document being prepared by international experts to define SFM (sustainable forestry management) via ISO is a way to give directions for better forestry.

Parallel to this, under the guidance of FSC-Forest Stewardship Council, companies, NGO's and government agencies, are dealing to establish performance criteria for forestry.

In both cases, quality will be added to the wood production process.

It is important to understand that wood is man's necessity and forests are man's and Nature's requirements. It is good to know that we need production forests and preserved forests. This understanding is not to be restricted to the forest area, but enlarged to the agricultural, social and forest network. We shall avoid extremism "in favor of environment", many times with clear damages to man and to Nature.

It is fundamental to plant trees in the planet. We

cannot fight against this need. It is also a way to avoid that the remaining natural forests be harvested for human consumption. How and where to do it? Once more, it is something to be faced case by case. There is no generic rule, but planting of new forests could be destined to already degraded areas that had forests in the past. It is also important to evaluate the social benefits to the local population, not only the benefits to the fauna and flora.

Production forests demand a sustainable environment for their growth and recognition by people.

Based in our discussions up to now, are we able to predict the forest world at the end of the next century? What to do, since population will grow as far as forest-based products consumption? We cannot forget that one century flies and we must be fast to implement new measures and new philosophy.

In a program to build a sound future, the mistakes of the past are to be considered as lessons and not for bringing feelings of guiltiness. Realities change with time: something considered very good today may be considered a disaster tomorrow, and vice-versa.

Besides all, there are different futures to be built. The futures of forestry in the USA, Canada, Scandinavia, Indonesia, Brazil, China, etc. have to be different. The important factor for building the desired future is to be fast, courageous and with good vision. We cannot let emotions lead to irrational environmentalism, believing that the world will always be worse. With this viewpoint, it is better to stay home crying and praying for the black future which is being predicted. We have to get away from the "back-to-the-past" philosophy. It is better to believe in the "jump-to-the-future". The past is gone and will not be back; it only brings lessons to build the future. The new forestry model cannot be romantic, but based on science and common sense. We cannot

forget that population will be eager in the outside, wishing to consume forest products. Forest is no longer a source of wood at low price; it is no longer a renewable resource; but it is a social, environmental and economical heritage. We shall not feel guilt for using it.

## **SUSTAINABILITY X ENHANCEABILITY**

I have already said that *sustainability* has a restricted meaning. It has no positive appeal. The idea of sustainability is to break devastation and to keep the remaining to the next generations. Based on positive feelings, my proposal is to use the term *enhanceability*, covering not only environment, but also the social aspects of environment. We cannot forget that man is an important component of environment, thus, social problems are environmental problems.

Most of the demands in the next century will be of a social character, since we will be too many compressed in an Earth of even more limited resources.

Today we are dealing a lot with green labels and environmental certification. In a few years, the next labels will be social (social label, quality of life certification, etc.).

## **QUESTION MARKS IN FORESTRY**

With the purpose of bringing people to reflect about forestry, some of the most questionable issues on this activity are being presented. It is important to face these questions in a constructive way, even so, because the most enthusiastic questioners wish to continue to use forest products in their ordinary life.

### **Issue 1: Loss of biodiversity**

This is not applicable when new forests are established in degraded areas, old and eroded pastures, etc.

### **Issue 2: Plantations / monocultures**

There are restrictions to homogeneous plantations when they are huge and with no care about blending plantations with other forests and agricultural activities. We shall consider the whole network to identify its environmental health.

### **Issue 3: Concentration due to economy of scale**

Again, the network is fundamental. It is also possible to compensate by the multiple use of the forest and of the tree, blending forestry and agroforestry systems to enrich them.

### **Issue 4: Exotics**

It is difficult to speak about geographical frontiers nowadays. Since exotics are well studied and adapted to the places they are growing, like eucalyptus in Brazil, why be afraid of them?

### **Issue 5: Clear cuts**

It is a controversial issue, but on the way to being clarified through good science. Through a good harvesting planning, the problems of clear cutting may be minimized. Also, multiple uses cooperate to remove wood gradually from the forest.

### **Issue 6: Preservation of natural forests**

This is everybody's commitment and a legal obligation. Harvesting of natural forest must require special permits.

### **Issue 7: Minimum environmental impact practices**

The forester must evaluate the environmental impact of his activities and look for minimum effect techniques.

### **Issue 8: Use of agrochemicals**

Toxic compounds are still required in combatting pests, diseases, insects. However, through research and creativity, this practice may be minimized.

### **Issue 9: Social impacts**

Although some improvements have been made in this subject, there is still a lot to be done. It is important to consider the impact of mechanization on the local job generation. This measure, when required, shall be well planned.

### **Issue 10: Social forestry**

Social forestry is associated with the production of wood by small farm owners, on a small scale, as part of their agricultural products. A few years ago, social forestry was poorly valued by the large scale wood producers. However, it is now considered as one of the best alternatives for the next century.

### **Issue 11: Agroforestry**

Farmers and forest-based companies have already discovered the agroforestry potential. Thus, agroforestry is a natural trend.

### **Issue 12: Multiple uses of forests**

There is a growing interest in having more than a single product coming from the forest. Essential oils, fuelwood, bark, wood chips, honey, fruits, and many more: this is the new menu from the forests.

### **Issue 13: Forest certification**

A trend supposed to give reliability to the forest industry: EMAS, ISO 14000, FSC, CERFLOR, BS 7750 and so on, they are key points now.

### **Issue 14: Forest legislation**

Legal restrictions are necessary but cannot be stricter than required. The forest-based industry must follow the process in a continuous dialogue and good willingness.

### **Issue 15: Forest research and the role of universities**

It is already time for the academic world to perform the role of extension and to be more

linked to the public, helping communities to better understand the technical, environmental and social issues of forestry. Research must provide knowledge to decision-making processes. The next R & D generation will not be regarded only with the technological issues of forestry. Instead of focusing on specific subjects, the research will be more holistic, more interdisciplinary, more cooperative, and covering broader matters. Research will be directed to problem-solving, aiming at results and helping to understand questions marks. R & D is no longer a process just destined to add knowledge without demands. Our prediction is that the preference for researching will be fields such as: natural resources conservation, environmental education, sustainable management, agroforestry, social and community forestry, environmental impacts and minimization, etc.

## **AGROFORESTRY**

Agroforestry is the combination of agriculture, zoo technology and forestry. It is a viable and highly successful new science. It may happen on the side of the farmer, who may produce some wood on his land; or on the forest-based industry side, which may have food production besides wood. The agroforestry system is more complex and demands more knowledge and planning. It has several advantages such as:

- better site utilization,
- improvements on soil conservation,
- better income, evenly distributed throughout the year,
- improvements in pest, disease, and insect control by biological means,
- better environmental harmony,
- reduction of risks due to production losses,
- appropriate use of shading for cattle raising,
- expanded menu of products and services,

- improved quality of life for farmers and local communities,
- reduction of costs,
- better use of labor,
- reduction of social exodus from farmlands to cities.

There are many many alternatives, as those involving the growth of trees and soybean, corn, beans, pastures, coffee, palms, etc. Eucalyptus and pines are perfect for agroforestry systems.

Cattle breeding is one of the most synergistic systems: a) cattle receives food, protection, shade; thus having faster growth; b) the forest receives manure and natural removal of weeds (weeds are no longer weeds, but food for cattle). To avoid damage to the trees, it is better to raise young animals or sheep. When cultivating leguminous species as pasture, the trees thank the fixed nitrogen.

Agroforestry may also require fewer trees than usual. This procedure may be compensated by the larger volume of harvested trees, with logs more valuable for lumber.

According to the World Development Report 1992, a World Bank publication, 25% of the total available land on the planet is occupied by permanent pastures for steers/oxen and sheep. Forest lands correspond to 31%, but are being reduced by 0.2% yearly. Agriculture requires 11%, but grows by 0.3% / year. It is not difficult to conclude that we live in the "cattle age", being ox, this curious animal, the most important animal in Earth.

Agroforestry farming may reduce this impact and predatory land-use by cattle.

Another great potential for the agroforestry activity is the joint production of trees and fruits for juices. Mangoes, avocados, pineapples, and papayas are some of the many examples of possible integration with forests.

This is a precious alternative for a juice demanding world.

## MULTIPLE USE OF FORESTS

The forest-based industry is very much dependent on scale of production. This leads to a high sensitivity to market fluctuations. One of the manners to reduce this dependence is by diversifying production. Multiple use covers: multiple use of the forest, of the tree or of the wood.

In this complex system, we may have wood for different purposes (furniture, pulp, hardboard, fiberboard, veneers, etc.); trees with segregated components (leaves for essential oil; bark for tannin, cork or fueling; etc.). From the forest, we may have sustainable production of wood, medicines, hunting, entertainment, etc.

In a model like this, we may escape from production, production, production of a single product, which is, in general, a raw material of low cost to a productive process elsewhere.

The integration of multiple use management with local communities helps local economies. The industry will be able to transfer technology and to provide raw materials, often wood residues from its main production line. It is very well-known in Brazil, the example of blossoming small saw-mills in the surroundings of pulp/paper mills. This generates jobs and brings power to the local economy.

## FORESTRY, SOCIETY, SUSTAINABILITY, ENHANCEABILITY

We know that social issues belong to the environment. There is no way to separate man from the environmental question. Quality of life and social justice are growing demands of all societies. As long as we do not live alone, the quality of life is something shared among people. Poor life quality for a group of persons

in general leads to raised violence, and the reduction of life quality on the whole. In our continuous search for development, everybody must have this in mind. The distance between rich and poor people cannot continue to grow. The income distribution is another key point to deal with in the next century.

Every society is the summing up of the experiences along the life span. This process results in different cultures to be respected and admired.

We cannot pray for economical development without sharing it with social and environmental developments. Everything today is connected. The forces of these links are strong and shall be known.

Human beings are, by nature, good workers and observers. Their main richness is the intelligence which enables them to find new ways.

In the future, how will the planet be shared between people and forests?

How can a forest segment contribute to economical, social and environmental development?

What do we mean by sustainable forest management?

The answers to these three questions will only depend on the intelligent way in which we will generate social and environmental benefits, associated with the economical gains of forestry.