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FORESTS OF TOMORROW

Since my early days, I am involved with the things of Nature, and I always loved it. For sure, this is the reason I am an agronomist, trying to match production of industrial goods from Nature and to better understand and to practise what everybody today calls "sustainability", including Mankind Sustainability.

Whatever the reason, forestry is a subject everyone feels comfortable to speak about. My purpose in talking about the forests of tomorrow is far from being provocative. My lack of understanding on many aspects and laws of Nature makes me build a hypothetical approach based on my reflections and on my experience, thinking in a constructive way. The purpose is not the confrontation with other thoughts, but to involve as many people as possible in the discussion of the future of man and forests on Earth.

Nowadays, Quality is a well-mentioned word. When you pronounce it, it is important that you feel the meaning, the real meaning. Quality, for a product, is something simple because you are dealing with specifications and customer's satisfaction. Some specifications are very simple, like the taste of an extensively sold soft drink all around the world. On the contrary, Quality for Nature is a very complicated matter. First, because human beings are part of Nature, and each one has a different approach about this subject. Second, is that Nature and knowledge vary with time. Something full of quality today may be considered very bad and wrong a few years from now, both by Nature or by the next generation of people.

Man could be considered a masterpiece of Nature, one of the best engineered machines ever made, but with some constructive defects. The most important is that no man is able to make photosynthesis, a simple reaction that even the least developed weed is able to. Because this inability to generate their own foods and fuels by extension, men became important predators.

Man alone is a weak and fragile animal. He needs to live in groups to guarantee protection to the species survival. However, man has gone too far on this. Population growth and concentration of people in mega-cities are bringing great concern to all of us. However, quality of life is not deteriorating yet, as many state. By contrary, life is getting easier and longer in all countries. Thus, Earth is not dying as is shown in movies or books, but only changing. We are responsible for many of these changes, mainly the ones related to Natural Resources. Exploitation of Nature has been one of the reasons for the improvements in the quality of our life.

In the past 30 years, man has started to travel to space. These trips enable us to discover that atmosphere, our home and the home of all living beings, are a very very tiny layer of life circling a tiny planet. In this small home we are not alone, we have lots of relatives, some of them we do not even know. However, we human beings, we all love one of our relatives: the forests. There is no single person who does not like forests. By extension, we all love wood, wooden houses, furniture of solid wood, handicraft on wood, etc.. Wood products such matches, pencils, charcoal,

pulp and paper and so on are part of our lives, filling many of human needs. This situation is bringing a tremendous conflict to all of us. At the same time we all love the forests, wishing to have them preserved, we need products we love for our better quality of life.

History is a succession of moments and each moment has its own history. Although globalization is taking place in Earth, moments are different from place to place. It is not wise to highly interfere in different societies and in different places to modify their moments according to our wishes. People, places, climates, cultures, natural resources, etc., are different in the different countries and even within countries. We all know this. It is more or less like to have the different Alvin Tofler's waves happening at the same time in different places or at the same place. If someone squeezes one wave you may have a storm as a consequence. Given the fact that we are different, we have to reflect and to respect differences. North/South and East/West differences have to be recognized and understood.

Today's worldwide priorities are: human rights, human needs, social welfare, environment and humanity's sustainability. You face these matters in your common life since the media places them in priority.

Since we are in a strong transition time, we may feel lost sometimes, but we shall not give up. Let's set our foundations on positive emotions and work for the future.

To be sustainable means to achieve in all societies a clear knowledge of a quality of life that could be kept many generations ahead, because it is socially correct, it is economically feasible and it does not hurt ecosystems, including the ones man created (cities, farms, etc.). How far are we from Sustainability? How to move in this direction?

Do we know the direction?

In Nature, changes occur gradually, but not sharply. We must move from one scenario to another not very fast because in many points we have no guarantees that the new scenario is better than the previous one.

The combination of all these thoughts and ideas is a required preamble to provide some background to start our story about *the forests of tomorrow*:

The forest-based industry has a sour philosophical conflict today. At the same time it believes that it performs in an environmentally-friendly pattern, its survival is threatened by lots of criticism from public opinion, more stringent legislation and regular attacks by the press and by environmentalists.

The idea that the forest-based industry is merely extractivist grows in the public's mind. Children learn in schools that trees are harvested or burnt and animals are killed without any other justification than economical growth and progress.

At the same time, Society also faces the conflict of loving living trees but requiring loved wooden products.

If the situation involves philosophical conflicts, how can we solve them, when emotions are in the game?

What is curious, is that those who plant and/or use forests are in a defensive position, instead of being proactive. Some

compare their plantations to agriculture; others try to prove they are sustainable because they harvest natural forests with lots of biodiversity in a friendly way.

In both cases, arguments are weak and difficult to sustain.

Agricultural crops have a social role and food represents our survival. Human beings accept, with restrictions, but they do accept, the agriculture monocultures and grass fields for cattle growth. They know that agricultural frontiers have invaded natural forests, and are still invading them, but accept this fact. The reason is that food is a human need and people have this in mind when forgiving crops replacing forests.

Plantation forests in Brazil cannot be compared to agriculture crops, because they are able to grow in places agricultural crops are not. Degraded and almost exhausted soils, stony land, sandy soils, etc., are well-suited to house the plantations of eucalyptus and pines. These species have few requirements on soil fertility and they do not compete with agriculture for land usage. However, soil is a living entity that has to be managed to guarantee forestry productivity in the generations ahead. This is one of the main challenges of the forester through appropriate planning, understanding and good science.

On the other hand, suggesting the harvesting of trees (many are required) from a balanced natural forest also brings a conflict, since harvesting will strongly interfere with the surrounding biodiversity, creating destruction and mess.

Today, fast-growing plantations support the forest-based industry in many countries (Brazil, Indonesia, Chile, New Zealand, etc.). The wood from these planted forests represents less than 10% of total industrial harvest, but they have strong potential for growth. However, global wood supply grows in a not very predictable way. Biodiversity conservation, environmental and social issues and wood production costs are establishing the new forest model and the new wood market pattern.

Forests are much more than an economical resource. They have several functions we cannot forget such as: soil conservation, local climate stabilisation, storage of carbon dioxide, biodiversity protection, protection of slopes, regulation of water balance in a watershed, and social roles. By social functions we shall understand all those related to Mankind and Forests. Men in ancient times had the forest as their home. Forests could supply them with food, housing, entertainment, protection, beauty and rest. These are reasons why mankind "has a gene in the genome", for a special love of trees. Our survival as a living species is due to the forests.

In the past, ancient forests were able to perform all these roles. Things have changed, forests are fewer and people are more numerous, demanding high wood volumes.

Perhaps today, the most important environmental justification for plantations is the ability to supply wood for industrial and other needs, thus reducing the pressure on natural forests. Since they are established in degraded land, they are also a way to give these lands back their productive status.

The public criticism of plantations is based on two main

aspects: a) monocultures ("green deserts which are replacing natural forests"), b) social-economical objectives, such as the threat plantations impose on local culture and land use for other people's purposes.

On the other hand, industry requires wood at low cost, maximum homogeneity, and preferably close to its location; which means large planted areas to supply the required volume. According to the forester, these plantations are wonderful when they grow fast, when they are very uniform in tree dimensions and wood quality, and they are "clean" in terms of other types of vegetation.

How to make these different wishes and thoughts compatible?

How to avoid people stopping from planting forests because of the fear of the threats?

How to avoid the new type of forestry to go only in the direction of natural forests, interfering again in the biodiversity and in the ecological balance when harvesting the forest? After all, there is not a single model for Sustainable Forestry. Something ecologically sustainable in Germany does not necessarily apply as sustainable in Brazil, or Scandinavia and vice-versa. Do not forget, we are different.

How to humanise the relation among land/forest/men?

How to measure the value of Nature in the products we need and use? How to evaluate the Natural Resources value?

These conflicts surely are guiding us to a new forestry model. We have to understand that Man is on the Earth to stay and so are forests and wildlife. Thus, a model giving advantages to both must be looked for.

Forests of tomorrow must be compatible with all these features. We shall not discard all accumulated knowledge in terms of obtaining low cost wood at a fast growing rate.

Also Nature cannot be left to a second level. Finally, we have to keep in mind that man is part of this environment, and we are some of the men I am talking about.

The solution in the forests of tomorrow is not to watch just a part of the subject, but the whole. We shall not watch agriculture, wood production oriented forest plantations, Nature and Man isolated. In the forest of the future, they have to be considered all as a whole. In this case, we are not obliging a part of the whole (plantations, for example) to perform all forest roles and functions, but we may have this from the net or the mesh we can create.

Forest plantations of single species or cloned trees must be considered a special gift from Nature, as the natural forest rich is in biodiversity.

In the forests of tomorrow we have to restore all functions the ancient forests provided to man and to wildlife. At the same time, the forest mesh has to provide uniform and low cost wood to the industry to reduce cost of living to society.

The solution is not to think in a single forest, but in a forestry net or mesh, comprising areas with homogeneous plantations, agriculture and preserved natural forests, rich in biodiversity.

It is not important to have rich biodiversity in the area with

homogeneous forest. On the contrary, it is even better not to disturb biodiversity when harvesting the area of plantation wood. Moreover, there is always an interaction between the areas with agriculture, preserved natural forests and plantations of trees. There is biodiversity in all, different in quality and quantity, but shared in many cases. These biodiversities provide help one to another. Then, we cannot plan 100% clearcutting in all the plantations from a system. Always, some plantations have to be growing and providing home to the biodiversity the corresponding system has.

However, in the area of natural resource preservation, all biodiversity is welcome. Animals and plants are invited to grow and to stay. Since naturally preserved areas will be face to face with homogeneous forests, the animals may visit the plantations if they like. It is their option.

The biodiversity in the fast growing plantations will be of another kind: fungus, micorrizae, micro-organisms, insects, birds, etc. They are not as many in abundance, but they have quality and importance to Mother Nature.

Production of food is also a major issue in the mesh. Through proper planning, each land area will be used according to its vocation and aptitude. Areas of good quality soils will be destined to the production of foods; degraded soils to homogeneously planted forests; flooded areas, lakes, areas near rivers, etc., will be preserved with natural first-growth or enriched secondary-growth native vegetation. The accumulated knowledge for upgrading trees via biotechnology may help to save endangered forest species.

Animals and plants will be the heroes in these locations in the same way man will be the hero in the agriculture and tree plantation areas.

This model gives the same dimension to all components in Nature. They will have the same level of respect and understanding. In this case, man will not be considered as a robber or a murderer, but an important participant in the environment.

Industrial wood production shall not surpass Nature and social agriculture. They are all important. Adequate planning requires to decide with other users what destinations have to be given to the lands. Thus, this means a very high level of integration of the community.

Agroforestry is not to be considered as planting agricultural crops between the lines of the planted trees in the tender age. Agroforestry and zootechnical activities will be viewed under a holistic focus. The future forester must not only understand how to grow and harvest trees, but must also understand biology, agriculture, sociology, and related sciences required to keep the model running.

A broader use of the mesh is in the way of development. From the past model of planting a forest for a single use, the new model demands multiple uses for the planted forests. Leaves for essential oils and medicines; bark for composting; thinned wood for fuel; high-quality logs for lumber; wood residues for chips, etc. A new world is opening the doors to the forest-based industry.

What we today call native forest fragments will be changed to chunky natural resources areas. A clear understanding of how much to save in terms of areas, the benefits to Nature,

and the costs associated with preservation, is required. The area to be kept preserved forever depends on how much biodiversity exists to be saved and how much is already preserved. We have to understand the role of each additional hectare left as savings to Nature. And also the cost. Thus, it is not wise to save all the area, and at the same time it is a silly option to harvest it all. There is a break-even point case-by-case.

The environment concept will change from the "my land" concept to the "our land" concept. The area to be considered is not only the one the industry owns, but also the ones in hands of communities and government. Environmental partnership for sustainable planning will bring together industry, government, local farmers, environmentalists and scientists. The dialogue may be rough to start, but the need for understanding will guide them to the right words.

Today, there are a lot of discussions about forestry sustainability and certification of forests. It is my understanding that we have today many wonderful examples of forest practices in the pulp and paper industry. They are pretty close to what people are defining as sustainable management. However, most of today's forestry operations have Man only as a tool to plant, harvest, fertilise, etc. Man is not considered part of this environment. When the forest achieves a self-supported growth, man goes to other places, returning only at the time to harvest, years later.

The main function of today's forests is "to produce wood and to save some environment". The other forest functions become forgotten or are only occasionally recalled.

In the forests of tomorrow, the forestry mesh will fulfil all roles a forest should perform, including the social role. The criticism of today can be largely overcome by proper plan-

ning and by choosing the right sites and sizes for each activity. Well-planned forestry may contribute to local welfare, industry development, job generation and environmental protection. Planning should include environmental and social impact assessment to maximise benefits to Man and to Nature.

The new forest net will generate industrial wood (monogenomic or not); it will provide other forest products to Society; it will house animals and plants; it will have the desired biodiversity; it could be considered a beautiful and joyful environment for people's entertainment; it will bring back the social role of forestry; it could bring people to live again in rural areas; it will have a balanced and diversified production; it will play its role in soil and climate conservation; it will generate jobs and it will give opportunities to small investors and forest owners, who could work on an integrated basis with the industry.

The model is supposed to bring to all participants the respect of life, animals, plants, Nature and the fast-growing plantation forests. It will also bring justice to trees which are important to mankind such as eucalyptus, pines, acacias, poplars, etc.

All this demands a high level of integration with the community. The industry must open doors and windows. The level of transparency and confidence in both directions is fundamental to the success of this new style of management.

Enthusiasm is something I bring to offer free to everybody. We are all Citizens of the Earth trying to find an overall consensus on an issue, and we need to reach it soon. It is my understanding that enthusiasm only walks side-by-side with optimism.