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Forests: the future of our planet

Report[1]
Committee on the Environment, Agriculture and Local and Regional Affairs
Rapporteur: Mr Vyacheslav TIMCHENKO, Russian Federation, European Democrat Group

Summary

Forests play a fundamental role in regulating the Earth's climate and safeguarding the environment in general by preventing soil erosion and floods and decreasing wind speed, thereby helping to reduce desertification. Given that the majority of the species living on our planet live in forests, they also make an important contribution to preserving global biodiversity.

Nevertheless, despite the fact that European reforestation policies have produced positive results, there is little biodiversity in most of these forests. The world situation is much more alarming as there has been a significant decrease in the surface area covered by forests, particularly in developing countries, as a result of illegal logging operations.

The Assembly therefore proposes that more effective monitoring mechanisms be established to curb deforestation and that international agreements be drawn up, particularly for countries with substantial financial resources. It also proposes that sustainable forest management techniques be developed and that education and awareness-raising campaigns be conducted with a view to preventing forest fires.

1. Reference to committee: Doc. 11634, Reference 3471 of 27 June 2008, and Reference 3500 of 28 November 2008.

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A. Draft resolution[2]

1. Forests are often referred to as the “lungs of our planet”. The estimated area covered by the world’s forests is about 38 million square kilometres, slightly more than half of which is in developing countries. Forests perform photosynthesis and produce organic substances, using atmospheric carbon dioxide as a source of carbon and releasing oxygen back into the atmosphere. Because of their huge biomass, forests have a tremendous impact on the gaseous composition of the planet’s atmosphere, thereby helping to counter global warming.

2. Forests also perform other environmental functions. They play an important role not only in controlling the Earth’s climate but also in protecting the soil (by preventing soil erosion and floods) and water (by controlling the water balance). Forests also help to reduce desertification, by decreasing wind speed, which helps to prevent soil erosion and accumulate moisture.

3. Forests also play a significant role in preserving global biodiversity. Tropical, temperate and boreal forests offer a diverse range of habitats for plants, animals and micro-organisms and the majority of the species living on our planet live in forests.

4. Forests are also very important for the economy of some countries while at the same time playing an environmental, social, cultural and recreational role.

5. The Parliamentary Assembly notes however that there has been a significant decrease in the surface area covered by forests, particularly in developing countries, where there has been an increase in illegal logging, in violation of legislation and the international conventions in force, leading to substantial losses, particularly for timber-producing countries. In many cases, the proportion of illegally produced timber far exceeds that of legally produced timber.

6. In Europe, on the other hand, the surface area covered by forests is increasing as the result of a serious scientific approach adopted to reforestation. A large proportion of the forests planted in Europe are monocultures with little biodiversity. The Assembly regrets that a substantial proportion of these plantations comprise alien species.

7. The Assembly would underline the fact that the importance of European forests for the conservation of nature was acknowledged in the context of the implementation of the Bern Convention and that several types of forest habitat are listed in Appendix I to Resolution No. 4 of the Standing Committee of the Bern Convention and in Appendix I of the EU “Habitat Directive”. The Assembly also welcomes the establishment of the Emerald Network and the Natura 2000 Network.

8. The Assembly would also draw attention to the two major world conventions signed at the United Nations 1992 Conference on Environment and Development in Rio de Janeiro – the Framework Convention on Climate Change and the Convention on Biological Diversity – which concern the conservation and sustainable use of forests throughout the world.

9. The Assembly draws attention to its Recommendation 1761 (2006) on preventing forest fires and to the fact that most forest fires are caused by human beings and lead to considerable losses in terms of flora and fauna. The Assembly deplores the fact that the vast majority of fires are caused directly or indirectly by people who do not comply with safety regulations.

10. The Assembly believes that it is necessary to establish more effective monitoring to curb deforestation and harmonise the legislation governing forestry in the different countries. The Assembly therefore invites the Council of Europe member and non-member states and the organisations concerned, to:

10.1. set up a committee within an existing organisation (the UN, for instance) to be responsible for the development, adoption and enforcement of legislation designed to preserve and protect forests;

10.2. draw up international agreements on forest protection which would be binding on all the countries with significant forest resources which ratify them;

10.3. devise and introduce a system for the payment of a tax in respect of every unit of greenhouse gas, to be allocated for forest rehabilitation purposes to countries which have forest resources, in proportion to the volumes of greenhouse gases absorbed by their forests ;

2. Draft resolution adopted unanimously by the committee on 28 May 2010.

10.4. register the organisations concerned existing in countries with significant forest resources with the aforementioned committee so that the former have authority to monitor compliance with the new legislation and the forestry situation;

10.5. take the necessary steps to prevent and detect forest fires and improve response times and forest- fire-fighting technologies to reduce the number and the extent of such fires;

10.6. develop and implement tried and tested sustainable forest management techniques;

10.7. introduce criminal sanctions for pyromaniacs;

10.8. take steps to launch education and awareness-raising campaigns with a view to preventing forest fires;

10.9. establish climate policies which take into account the role of forests as carbon sinks and stores in order to tackle worldwide environmental challenges such as global warming;

10.10. carry out reforestation in a carefully supervised and scientific manner and avoid monoculture and particularly the large-scale planting of alien species;

10.11. support the work being done by forestry protection and inspection departments, in particular in dealing with insects and forest diseases;

10.12. ensure that forestry management complies with the following principles:

10.12.1. use of forests not exceeding their capacity for regeneration;

10.12.2. preservation and strengthening of forests' environmental and protective functions, (in particular the protection of soil and water) and forests' other functions;

10.12.3. good management and conservation of forest biodiversity;

10.12.4. setting-up a procedure allowing the use of forests in accordance with their size, functions, location, and environmental and economic conditions;

10.12.5. creating the conditions for forest regeneration;

10.12.6. compliance with science-based rules of use;

10.13. make it compulsory for forestry industries to use more efficient processing technologies which provide a better final output while using a smaller quantity of raw materials.

11. The Assembly also invites the Congress of Local and Regional Authorities to study and encourage good practices in forest conservation at local and regional level.

B. Explanatory memorandum by Mr Timchenko, rapporteur

1. Introduction: forests as the basis of life

1. Plants are the basis of life. It was plants which first made the transition from sea to land, and they are the first link in the food chains on Earth – using energy derived from sunlight they produce organic substances subsequently ingested by animals and humans. Plants perform the most active role in the oxygen cycle. Their huge biological mass gives the processes of photosynthesis and respiration a tremendous impact on the gaseous composition of the planet's atmosphere.

2. Forests are the main type of plant life in many land biomes, usually comprising one or more types of trees with a dense leaf canopy. Forests are also places where herbs, shrubs, mosses and lichens grow. The forest ecosystem is capable of sustaining itself, and this is its key attribute. It means that a forest may live for much longer than any of its trees. While trees may take root, develop, age and die, old trees are succeeded by younger ones, and the forest itself remains in its entirety.

3. Forests may be needleleaf or broadleaf (or mixed), deciduous or evergreen. They provide the living environment for many birds and animals and are a source of timber, berries, mushrooms and raw materials. Biomass accumulated within forests constitutes 90% of all terrestrial biomass (representing between $1\ 650 \times 10^9$ and $1\ 911 \times 10^9$ tonnes of dry weight, with coniferous forests accounting for 14% to 15% and rain forests for 55% to 60%). The world's forests are therefore important carbon stores.

4. With their important role in climate control and soil and water protection, forests represent an important factor of biospheric sustainability, and continuing efforts need to be made with a view to their preservation and reproduction.

5. Forests have always been of great importance for humans. They play a significant role in some modern economies, while also having high environmental, social, cultural and recreational value in most. It must also be noted and taken into account that large ancient forests are homes to many indigenous human populations.

2. Role of forests in relation to global environmental issues

6. The Earth's forests perform a number of essential environmental functions, for instance removing and storing carbon dioxide from the atmosphere of our planet, preventing soil erosion and controlling the water balance.

7. As we all know, forests have often been called the "lungs of our planet". While not a very accurate one, this is a metaphor that does reflect the importance of forests in the global carbon and oxygen cycles. Forest trees, like all green plants, perform photosynthesis and produce organic substances, using atmospheric carbon dioxide as a source of carbon and releasing oxygen back into the atmosphere. One molecule of carbon dioxide taken in by a plant (that is, one atom of carbon bonded to two of oxygen) corresponds to one molecule of oxygen released back into the atmosphere. The carbon bonded during photosynthesis (included in the organic substances produced) is partially used by the plant for its own structure and partially returned to the atmosphere as carbon dioxide during plant respiration or decay. Thus the carbon used by the plant during its life cycle for its own structure is equivalent to the amount of oxygen that it has released.

8. Forests are so important as carbon stores because of their huge biomass and the long-term storage of organically bonded carbon in tree trunks. In boreal forests, for example, where decay is a slow process, the trunk of a dead tree will take between 100 and 500 years to decay, that is, the carbon accumulated by a tree during its life will be bonded for several centuries after the tree has died. But in ancient forests where the biomass has stabilised and decomposition rates are approximately the same as in primary production, the annual amount of carbon bonded by photosynthesis is roughly the same as the amount released during decomposition. In such conditions the forests are not acting as carbon sinks any more, but remain very important carbon stores for as long as their integrity is maintained.

9. It must be noted that in some cases the situation is more complicated, and old forests retain their function as carbon sinks, due to the accumulation of carbon in soil, for example. Furthermore, some wet forest ecosystems such as wooded bogs show significant permanent rates of carbon accumulation, even as ancient woodlands. The very humid soils and resulting oxygen deficit prevent dead organic substances from decaying. Such boggy soil accumulates dead organic substances (peat) layer by layer, with the thickness increasing as the years pass. The peat layers may be several meters thick – between 3 and 5, and sometimes even up to 10 meters. Boggy forests, like open, treeless peat bogs and many other wetland types, accumulate peat over a period of thousands of years, bonding carbon dioxide and releasing oxygen into the air. The

accumulated carbon remains bonded unless the bog is drained and oxygen is able to penetrate the inner parts of the peat bed. At that point, the process goes into reverse – the decaying peat releases large amounts of carbon dioxide into the atmosphere; such releases may be particularly massive in the event of peat fires, which are not uncommon in dry peatlands.

10. It is thus clear that any meaningful climate policy must take into account the role of forests as carbon sinks and stores in order to tackle a worldwide environmental challenge such as global warming, given that it is excessive atmospheric carbon dioxide that causes the greenhouse effect.

11. The role of forests in water protection is as well known as their “lungs of our planet” role. Their importance for water protection is not only recognised theoretically, but also put to practical use: many countries have enacted forest legislation in order to retain and preserve the forests which form a protective screen along the banks and near the sources of rivers, streams and lakes. There are relevant provisions of Russian legislation which require forest screens to be created along all rivers, lakes and reservoirs of any significance; the rivers which contain breeding sites of fish used for commercial purposes have the widest forest screens. The best-known aspect of the protective role of forests is their ability to prevent the erosion of river banks, reinforce slopes and prevent the development of gullies. If the slopes of a river valley and the banks of associated streams are wooded, bank erosion takes place on a significantly smaller scale – tree and other forest plant roots bind the soil, preventing the formation of deep drainage lines; thick forest litter, moss and lichen also protect the surface layer of soil; dead tree trunks and branches lying on the ground and slight undulations in the forest floor make the water take a more winding course and flow less rapidly.

12. Forests may have a considerable impact on amounts of rain and snowfall. It has been demonstrated that air is more turbulent in forests, causing greater amounts of precipitation. Wooded river basins may have considerably more rain and snow than treeless areas. Moreover, forests can, in comparison to herbaceous vegetation, evaporate significantly larger amounts of water (trees can recover water from much deeper soils than can fleshy plants); in other words forests return some of that water into the air, making the air more humid in forests than in treeless areas when the wind is blowing.

13. Large-scale deforestation is among the main causes of increasingly frequent disastrous floods, particularly in mountain areas, where greater amounts of snow may melt in areas lacking vegetation.

14. Forests are able to reduce wind speed, prevent soil erosion and accumulate moisture: these features are already being put to good use today in order to address the very serious environmental issue of desertification. One example of this can be found in the People’s Republic of China, which has, since 1970, been carrying out a governmental programme known as “The Green Wall of China”, which entails the planting of trees to cover an area of 350 000 sq. km in order to prevent the Gobi desert from expanding. An objective assessment of this large-scale reforestation effort would provide an important source of information for those making similar efforts elsewhere.

15. Last but not least, the role of forests in maintaining global biodiversity must be emphasised. Tropical, temperate and boreal forests offer a diverse range of habitats for plants, animals and micro-organisms. Consequently forests are thought to contain the majority of the world’s terrestrial species. Forest biodiversity encompasses not just trees, but also the multitude of plants, animals and micro-organisms that inhabit forested areas. We can view that biodiversity at different levels, including the ecosystem, landscapes, species and populations. Complex interaction can occur within and amongst these levels. In biologically diverse forests, organisms are thus able to adapt to continually changing environmental conditions, and ecosystem functions can be maintained.

3. Current situation of forests worldwide

3.1. General description

16. The estimated area covered by the world’s forests is about 38 million sq. km. A slightly greater proportion of them is in developing countries. It is estimated that the world has lost about 5.5 million sq. km of forests, the total loss of 6.5 million sq. km of forest areas (mostly in developing countries) being set against an increase of 0.9 million sq. km. Generally speaking, the reduction of forests is most visible in developing countries, although the amount of that reduction seems to have been lower than was predicted for the 1980s and 1990s, and that downward trend continues.

17. Studies have shown that the main factors affecting forests are agricultural development, in Africa and Asia, and major economic development programmes associated with migration and with infrastructure and agricultural development, in Latin America and Asia. In Asia, the establishment of oil palm plantations has

become a very important driver of forest loss. Although timber production is not the main cause of forest shrinkage, it is another important factor, especially because logging operations in many areas were accompanied by road building to make remote areas easily accessible for agricultural colonisation.

18. The map below, produced by the WRI (World Resources Institute), demonstrates the changes that have occurred in forest cover: it shows the area covered by the Earth's forests today as compared to 8 000 years ago.

Figure 1: The Earth's forests 8 000 years ago as compared to today. Forest cover that existed 8 000 years ago is shown in dark grey, and the forests still remaining are shown in light grey

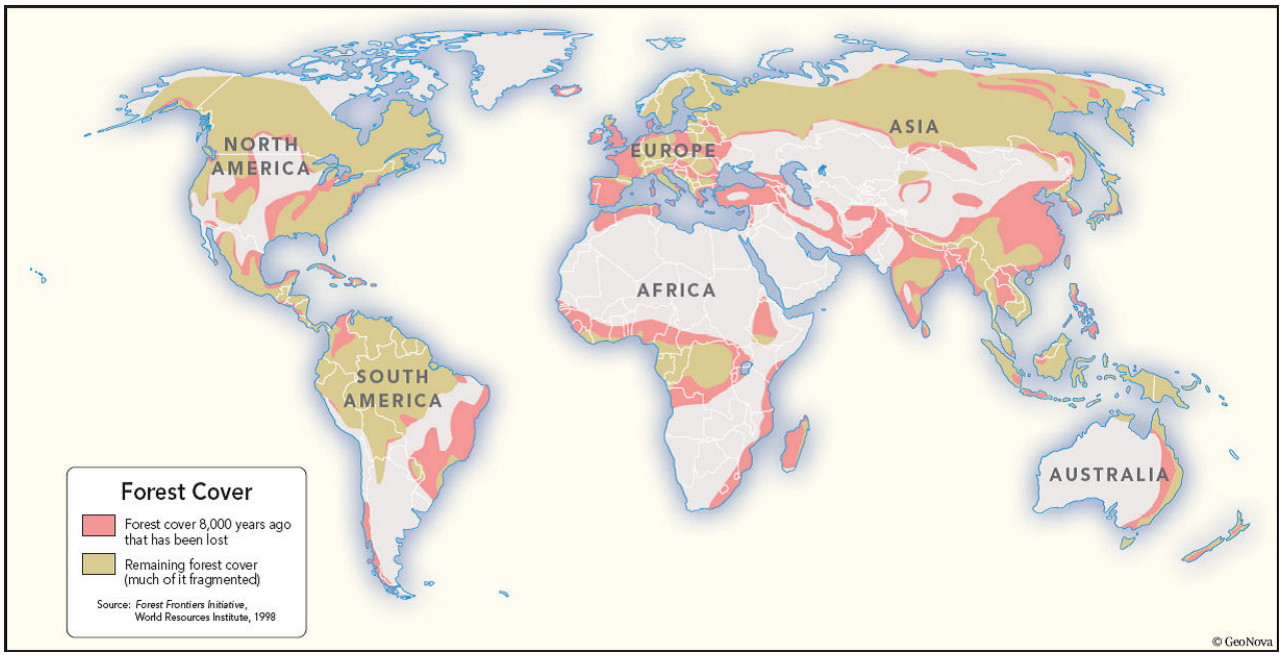

Table 1: Extent and causes of forest reduction on the different continents according to the FAO

Continent	Forested area, million hectares	Rate of reduction, hectares per year	Main cause
Latin America	990	5-10 million	Logging
Africa	730	2-4 million	Logging, grazing
Asia	600	2-4 million	
North America	580	40 000	Pollution
Europe	150	12 000	Pollution

19. The situation of the world's forests today cannot be described as good. Forests are intensively logged and rarely regenerated. Annual logging removes over 4.5 billion cubic metres. There is particular public concern worldwide about tropical and subtropical forests, where logging accounts for over half of global annual prescribed yield. Some 160 million hectares of rainforests have already been destroyed, and only 10% of the 11 million hectares logged each year is regenerated through the planting of homogenous forests. The rainforests which cover about 7% of the surface in areas near the equator, in particular, are often termed the "lungs of our planet". They play an exceptionally important role in adding oxygen to the air and absorbing carbon dioxide. Rainforests provide a home for almost 4 million species. They are the habitat of 80% of insects and two thirds of known plant species. These forests produce one quarter of our oxygen reserves. Some 33% of the world's rainforest areas are in Brazil, while Zaire and Indonesia each have 10%. According to the FAO, these forests are being destroyed at a rate of 100 000 sq. km per year.

3.2. The forests of Europe

20. About 8 000 years ago, 70% of European territory was covered by forests. They were almost everywhere, other than in high-mountain, exposed or poorly drained areas. As the population has grown and new equipment been developed, forest logging has increased rapidly. Some areas have been cleared for agricultural purposes, and the wood has been used for building or as fuel.

21. The forested areas of Europe (not including Russia) have now shrunk to 68% of their original size, while only 1% of old forest stands remain. Extensive forest areas remain only in northern Europe, sub-Alpine regions and in the European part of Russia. A positive fact, undoubtedly, is that in recent years the forest area in Europe has grown by 4%, which is a greater increase than in any other part of the world.

22. Russian forests play a key role in preserving global biodiversity and biospheric functions, because it is there that the widest range of natural ecosystems as well as considerable numbers of the different species of the world are found.

23. Russia occupies a unique position in terms of the variety of latitudes and zones which shape its biodiversity, because its territory features clearly interlinked zonal natural ecosystems. More than 180 native woody plants and shrubs, which form forests, are known in Russia.

24. Within the European Union, forests exist in a great variety of climatic, geographical and ecological conditions: in a temperate or boreal climate, in Mediterranean or alpine zones or on plains. Socio-economic conditions may vary considerably from one country or region to another.

25. Europe's forested areas are expanding faster than woodlands are being lost to infrastructure and urban uses. This trend, which began in the 1950s (and even earlier in certain countries), is attributable to a variety of factors. Several countries have extended their forest cover through planting programmes on uncultivated farmland. This positive development distinguishes the European Union from the numerous regions elsewhere in the world where deforestation continues to reduce forest resources. It should be noted, however, that unless the planting of forests is properly planned, it might harm agricultural land of high natural value and destroy the habitats offered to flora and fauna by open landscapes.

26. The importance of European forests for nature conservation has been recognised in the context of the Bern Convention. Several forest habitat types are listed in Annex I to Resolution No. 4 of the Standing Committee of the Bern Convention and Annex I to the EU Council's Habitats Directive, and have to be protected in the framework of the Emerald and Natura 2000 networks respectively.

4. Global issues relating to the situation of forests

4.1. Forest management

27. Forest management is one of the types of natural resource management which is sustainable only if it abides by a few simple principles:

– use of forests not exceeding their capacity for regeneration;

– preservation and strengthening of forests' environmental functions, role in the protection of water and other resources, and other functions;

– management and conservation of forest biodiversity;

– allowing the use of forests in accordance with their relevance, functions, location, and environmental and economic conditions;

– creating conditions for forest regeneration;

– compliance with science-based rules of use.

28. Forest resources can be used for many purposes, such as:

– harvesting of wood;

– harvesting of gum;

– tree sap collecting;

– haymaking;

– drug plants and raw materials for industry;

– forest grazing;

– location for bee hives and apiaries;

– gathering of wild fruits, berries, nuts, mushrooms and other forest food resources;

– gathering of moss, forest litter, fallen leaves and cane.

29. Additionally, some forest areas may be used for field sports, research, cultural and health purposes, tourism and sport.

30. Many governmental and international organisations have now taken control of forest issues and, consequently, have an impact on the forest industry and on pricing. One of these is the Intergovernmental Panel on Forests (IPF) set up in April 1995 following the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. The IPF works with international organisations, governments, non-governmental organisations and the private sector. Its work has a great impact on the forest situation and the forest industry.

31. The State of the World's Forests (SOFO) report published by the United Nations Food and Agriculture Organization (FAO) provides regular information. The FAO's Global Forest Resources Assessment (FRA) is used as a basis for decisions by many other organisations. And the UN Environment Programme (UNEP) engages in some activities relating to the environmental role of forests and their protection.

4.2. Forest industry

32. Forest products, production volume, market conditions, prices and other relevant parameters are directly linked with the situation of the world's forests at any given time, the environmental situation and global and national forest management policies. Economic, political, demographic and social trends determine forest management practices and have an effect on the formulation of national policies and the establishment of relevant institutions.

33. The quantity and extent of forests are mainly affected by demographic changes (population growth and urbanisation), demand for the forest industry's products and the ability of forests to perform important environmental functions.

34. Political trends which influence the forest sector include decentralisation, privatisation, trade liberalisation and economic globalisation.

35. While the total area of forest cover is in constant decline, the demand for forest products is steadily growing. One of the most important trends is the development of more efficient processing technologies making better final output possible with the use of a smaller quantity of raw materials. It is also important to shift to more environment-friendly technologies.

36. The forest industry encompasses industrial timber and other kinds of wood. The list of wooden products is very long. The forest industry spans logging, timber processing, the production of pulp and wood chips, the production of wooden containers, the construction of wooden buildings and the manufacture of other wooden products.

37. Wood is subsequently processed to produce certain main types of timber. Various industries use about 20 different techniques, including sawing, milling, compression forming, forming, abrasive treatment, drilling, chemical treatment, etc.

38. The main adverse consequence of poor forest management is overlogging (more wood is logged than grows in any given year). Overlogging leads to the depletion of forest resources. The world's forest resources are currently being overlogged. Forest resources are renewable, but their regeneration takes on average between eighty and one hundred years, or even more depending on forest type. If overlogging occurs across wide areas, it can lead to the extinction of species as a result of habitat loss.

39. A logging rate below the rate of growth leads to forest ageing, lower productivity and diseases in old trees. So in order to maximise the economic feasibility of the forest industry, foresters tend to advocate forest management based on annual logging rates equal to annual growth. It should be noted, however, that while logging rates below the annual growth rate might not be economically rational, they might be beneficial to biodiversity, as older forests tend to provide habitats for greater numbers of species, especially rare and endangered species.

40. Environmental problems are linked not only to the volume of logging, but also to the methods used. A comparison of positive and negative consequences shows that selective logging is more costly but more environmentally friendly.

41. The forest industry provides raw materials for various uses, from building to furniture to paper. Provided that these products have a sufficiently long lifespan, they can potentially be regarded as additional carbon stores. The overall climate-related assessment of the forest industry, however, needs to be based on careful calculations of the “carbon footprint” of the whole product life cycle.

42. The use of wood as a renewable energy source can also be part of a sustainable forestry sector, provided that overlogging is not allowed and the needs of forest biodiversity are taken into account by those responsible for management. However, the replacement of ancient forests with plantations of fast-growing tree species in order to harvest these for biofuel is a typical case of “greenwash”, since more carbon may be released as a result of the destruction of old wood than is saved by replacing fossil fuels with renewables.

4.3. Forest fires

43. Forest fires are amongst the main abiotic factors contributing to ecosystem communities. Fire is a natural part of the life cycle of some forest ecosystems, such as the softwood forests of the south-eastern USA. In forests where fires typically occur, older trees have a characteristic bark that is resistant to all but the most destructive wildfires. Some types of pine cones, for example, those of *Pinus banksians*, once heated up to a certain temperature easily release their seeds. In some cases fires lead to soil enrichment by nutrients such as phosphorus, potassium, calcium and magnesium, enabling grazing animals to find nutritious food. Thus measures taken to prevent wildfires can result in changes to ecosystems, as these depend on recurrent exposure of their vegetation to fire. A build-up of unnatural quantities of unburnt debris in such forests can lead to a risk of extreme wildfires. In forest ecosystems with a natural tendency to catch fire, forest biodiversity to some extent depends on files of low intensity.

44. However, the majority of forest fires nowadays are of human origin. The statistics show that 97% of forest fires appear to be caused by human beings, while only 3% are due to natural causes. Both flora and fauna suffer from the fires, the vast majority of which are started by human beings making careless use of fire or breaking fire safety rules during agricultural activities. Debris-strewn forests are at greater risk of fire.

45. Every year forest fires consume 2 000 000 tonnes of organic substances. They also affect the forest industry, reducing the amount of new growth, bringing about a decline in forest diversity, increasing the numbers of trees damaged or uprooted by the wind, and causing soil impoverishment. In addition, forest fires facilitate the spread of harmful inserts and wood-destroying fungus. Frequent fires prevent further succession and the natural return of forest cover.

46. In populated areas with intensive forest management, forest-based enterprises use means such as fire alarm systems, chemicals, fire stations, etc., in their efforts to safeguard forests as appropriate from fire. Certain steps need to be taken in order to improve forest fire resistance by providing forests with a fire suppression capacity: set up a system of fire breaks and fire barriers, build up transport infrastructure and water supply networks, and ensure that forest floors are less strewn with debris.

47. Currently, forest fires are detected/located by fire detection and observation facilities/posts, as well as through the use of fire patrols on the ground and satellite monitoring. Ideally, an operational system for monitoring fires from space would allow complete coverage in real time of wildfires and their impact. When there are high concentrations of smoke, airborne infrared detectors would detect/locate burning areas of forest.

48. While improved fire-fighting technology will have an impact on fire size, more public education and awareness campaigns on radio, TV and other media are needed to reduce the number of fires occurring.

4.4. Forest diseases

49. The second substantial cause of damage and loss of forests is the occurrence of insect infestations and disease, one of the greatest threats to forest health, forest resources and biodiversity. While they are natural ecological processes in forests, insect infestations and the spread of diseases are tending to become more frequent as a result of inappropriate management. Over the past ten years, the average surface area of the territories in Russia that are constantly affected by insect infestation and disease has been 5.37 million hectares. Mass reproduction of herbivorous insects and the spread of diseases can cause forest losses of up

to 190 000 hectares. Larger areas of forest succumbed to needle and leaf-eating insects over the three years from 2005 to 2007, although in 2008 this phenomenon decreased by 640 000 hectares as compared to 2007, mainly due to a reduction in the size of planted areas.

50. There are several reasons for this situation: first and foremost regular sudden arrivals of huge numbers of insects. In favourable weather conditions insects breed more rapidly, and in most cases, this leads to infestation. According to the data available for 2007, Siberian forests, mainly in the *oblasts* of Tomskaya and Irkutskaya, were the most severely affected by insect infestations and diseases.

51. Among the recognised diseases fir canker is the most widespread (445 000 hectares). In Siberia, outbreaks mainly occur in the oblast of Kemerovskaya. General aggravation of the pathological situation in Russian forests – leaving aside the particular biological characteristics of some insects and diseases – results from an increasingly complex range of adverse factors and institutional shortcomings in the functioning of forest protection services, including a lack of specialists in the field, underfunding of forest pathological studies and monitoring, and insufficient forest pest control. The first of these shortcomings can be addressed relatively easily, through better standardisation and harmonised definitions.

52. To stabilise the pathological situation of forests, forest protection services/forestry inspectorates engage in practical activities to protect forests. Different methods and technical means are used to fight insects and diseases, but none of them are universally valid, capable of guaranteeing an integrated and wholly successful approach against all types of insects.

53. Each year specific measures to fight insects and diseases in designated outbreaks cover a total area of more than 500 000 hectares. The proportion of biological methods that include the use of bacterial fertilisers and virus preparations may be as high as 55%.

54. The fight against forest insects and diseases can be effective and efficient only if it is of a systematic nature, involves all appropriate means, is targeted on the appropriate types of insects and diseases and is adjusted to the ecological, climatic and weather conditions prevailing. It also needs to be borne in mind that, if the measures adopted to eradicate forest pests and diseases are too intensive, this can lead to a significant decrease of forest biodiversity.

4.5. Illegal logging

55. As the new millennium advances, illegal logging is on the increase. Furthermore, this increase entails breaches of not only forest and environmental laws, but also the relevant international conventions. Illegal logging results in huge forest losses every year, as well as a further loss to the economies of timber-producing countries. In many cases the proportion of illegally produced timber far exceeds legal production. The illegal activity depresses prices and undermines the profitability of legitimate enterprises. In some countries illegal logging reaches the same level as legal operations. In Indonesia, for instance, legal logging amounted to 25-28 million cubic metresin the late 1990s, while illegal operations lay somewhere between 17 and 30 million cubic metres(Natural Resources Management programme, Jakarta).

56. In some countries there are even some senior government officials engaged in illegal logging and other related illicit activities. According to a study conducted recently in Cameroon as part of the Global Forest Watch project, some high-level officials have amassed natural resources portfolios including a very large illegal forestry concession. It has also been alleged by several scientists that in Brazil, particularly in the Amazon Region, 80% of all logging is illegal. Not only tropical forests are subjected to illegal logging, but boreal forests as well. One example is in British Columbia, where, because of inadequate or non-existent supervision by the Canadian forest agencies, excessive logging has become established practice. There have been cases of logging within specially protected natural territories in Poland and Belarus. Unfortunately, illegal logging has become commonplace in Russia, where at least 20% of all logging is either illegal or involves breaches of the law.

57. Illegal logging can be divided into the categories below:

a. Unlicensed (unauthorised) logging

1. Logging by the local population – community logging – for non-commercial purposes (according to rough estimates, such illegal logging accounts for between 8 000 and 10 000 cubic metresper year).

2. Logging by nationals or organised groups for commercial purposes (illegal logging, depending on the region, varies from 16 000 to 500 000 cubic metresper year).

3. Logging by companies in areas where logging is not authorised, but which are in proximity to either a designated area or an area not readily accessible and difficult to monitor (illegal logging is difficult to estimate and may account for hundreds of thousands of square metres).

4. Overlogging in authorised and unauthorised areas.

5. Logging for unauthorised building on a non-forest site.

b. Licensed but illegal logging – Licensed logging could be illegal if logging in the area concerned is also against the law (the logging is not done in accordance with the terms of the contract).

1. Authorisation for logging was granted in an area which is protected by the law.

2. Authorisation for logging was granted in a case not in accordance with, circumventing or infringing the forest regulations in force.

3. Authorisation for logging was granted in a special area following unlawful amendment of the relevant forest instruments.

4. Forest management is not in accordance with the law.

5. Logging affected by wrongful activities violating the laws in force.

58. Illegal logging of high-value timber exceeds 600 000 cubic metresin Russia, equivalent in terms of value to 2 to 3 million cubic metres of timber of lesser value.

4.6. Reforestation

59. Reforestation means regeneration of legally logged forests and replanting of areas affected by illegal logging, fires and other adverse conditions, and involves the planting of new forests and an increase in woody species.

60. There are two kinds of reforestation activities: artificial forestation (creating artificial stands by planting saplings or seeds) and the encouragement of natural regeneration (involving the reforestation of logged areas using trees which will provide high-value timber, for example, mainly *Picea* and *Pinus* in taiga).

61. According to official statistics, 40% of logged territory in Russia was subject to reforestation over the last two decades. In most cases saplings aged between two and four years were planted for the purposes of reforestation. This technique has the potential to ensure a high survival rate, at the same time providing replacement stands. Saplings are usually planted in small areas next to indiscriminately logged taiga, so in the vicinity of logging roads (that is, easy to monitor), whereas the remaining logged areas (90% to 95%) are left unplanted, although some densely planted areas could be seen, but only near urban areas.

62. Activities to promote natural regeneration involve the use of seed trees or seed blocks, provided that seed trees are sufficient in number and are spaced sufficiently far apart to allow for wind dispersal. This practice has not always been followed, since such regeneration measures often boil down to leaving damaged seed trees without any commercial value which then fail to produce seed as they die. Certainly, there have been some successful examples of reforestation in forests of commercial value, where the forest situation is more or less under control and where there are some, at least, forestry activities (including logging and the planting of young trees across greater or lesser areas). Moreover, reforestation of coniferous forests may be successful in conditions that are unfavourable for rapid growth of small-leaved trees (such as the most nutrient-poor sandy or stony soils). However, there are few cases of successful reforestation of high-value coniferous forests in the taiga zone (in reality, no more than 5% of the total logging area), and these do not play a significant role in overall forest development in areas which have been logged.

63. Reforestation is carried out in many parts of the world, especially in countries of eastern Asia, where it is used as a means of increasing the forested area. The areas covered by forests have increased in 22 of the 50 most forest-rich countries. Asia as a whole gained 1 million hectares of forests during the period from 2000 to 2005, and rainforests in El Salvador expanded by more than 20% between 1992 and 2001.

64. In the People's Republic of China, where forest loss had been widespread, the government adopted a law requiring every citizen aged between 11 and 60 who is fit for work to plant between three and five trees per year or do equivalent work in other forest services, or to pay a corresponding amount of tax. The Chinese Government states that about 1 billion trees have been planted in China since 1982. On 12 March each year, China celebrates Tree Planting Day. The country has also begun a Green Wall of China project whereby trees are planted in an effort to prevent expansion of the Gobi desert. However, the high death rate of trees after planting (up to 75%) has led to an acknowledgement that the project has not been very successful. Since the

1970s, the overall area covered by forests in China has increased by 47 million hectares. Some twenty years ago only 12% of Chinese territory was forested; the figure today is 16.55%. While this is 4.55% higher, it is not a very high level considering the stated quantity of reforestation activities.

65. The current growth of forest areas in Europe is largely the result of the serious scientific approach adopted to reforestation, but it should be also noted that a large proportion of the forests planted in Europe are monocultures with little biodiversity. Worse still, the proportion of these plantations for which alien species are used is not negligible. Similar problems are found in other parts of the world as well.

4.7. Forest ownership

66. All over the world, ownership issues arise in respect of forests, with title often non-existent.

67. When the EU had only 15 member states, approximately one third of their forests and other woodlands were state property, as against two thirds privately owned. The percentage in state ownership has subsequently increased. While this change in the structure of forest ownership was coming about, other changes were occurring in the professional activities and lifestyles of private forest owners. In certain regions they no longer derive their main income from forestry, their lifestyle being increasingly city-based.

68. Although the percentage in private ownership has declined, the number of private forestry businesses has nevertheless risen. Some forests have been returned to their former owners in the EU's new member states, reintroducing the concept of private forest ownership in those countries. There are, however, great variations in the forest management skills and understanding of owners, in the size of forestry businesses, in the expectations of forest management and in the interest that it arouses.

69. The average size of public forestry businesses in the EU is over 1 000 hectares, compared with just 13 hectares for private businesses. The situation varies considerably from one country to another, and most private owners hold less than 3 hectares. In this respect, the structure of forest ownership in the EU differs from that in countries elsewhere with large amounts of forest resources, where the public ownership model is the most common, or even the only one.

70. Brazil is the country with the most extensive tropical forests in the world, and approximately 64% of its territory (some 544 million hectares) is covered by woodlands of one kind or another.

71. Its natural forest surface area which can be used for timber production is calculated to be 412 million hectares, of which approximately 124 million are in public ownership, including national forests, indigenous reserves, national parks and other conservation areas. The other 288 million hectares are mostly in private ownership. It is estimated that 15% of the forest surface area potentially usable for timber production is subject to permanent conservation measures, for such purposes as riverbank or water source protection, in accordance with the provisions of the country's Forestry Code. The forest surface area effectively available to supply timber is thus of the order of 350 million hectares.

72. In Brazil, the national space research institute produces annual deforestation statistics on the basis of between 100 and 220 photographs taken during the dry season by the Landsat satellite. According to the institute, the biome of the Amazonian forest, originally covering 4 100 000 sq. km in Brazil, had been reduced to 3 403 000 sq. km by 2005, representing a loss of 17.1%. Since 1970, the area of tropical forest lost is equivalent to the size of Texas (and larger than France). During the worst year for deforestation, 1995, an area the size of Belgium was lost to a constant onslaught by chainsaws and practitioners of slash and burn.

73. Former US Vice President Al Gore drew the wrath of Brazil a few years ago when he said that Amazonia belonged to the world as a whole. More recently, Brazilian President Luiz Inácio Lula da Silva denounced some British politicians who were encouraging their fellow citizens to buy plots of land in Amazonia to save them from exploitation. He proclaimed that Amazonia belonged to the Brazilians.

74. In the nine countries of Africa with the largest amount of forest cover, almost every forest remains publicly owned. Official figures indicate state ownership of 98% of the forest surface area.

75. There are several cases in which effective reform of forest ownership in Africa is prevented by a lack of political will and enthusiasm to recognise local and indigenous rights. Inadequate preparation and execution of reform are also problematic, even where indigenous populations' and forest communities' statutory rights are recognised.

76. The precedence given by governments to industrial concessions and conservation rather than the rights and subsistence of communities has also curbed effective reform. Lack of clarity in ownership rules has enabled governments to promote major concessions for logging, oil extraction, mineral extraction, biofuels and other agricultural products, to the detriment of forest populations.

77. Congo's Minister for Sustainable Development has estimated that expenditure of several billions would be needed just to find out all about forest resources and draw up inventories.

4.8. International initiatives for forest conservation and sustainable use

78. Both of the key global environmental conventions signed in Rio de Janeiro in 1992 – the Framework Convention on Climate Change and the Convention on Biological Diversity – entail work on conservation and sustainable use of the world's forests.

79. Questions arise today about how to distribute funds, which body should be responsible for managing them, and whether it is necessary to provide for a fund just for forests or to include forests in what should ultimately become a major "green fund", bearing in mind that that the developed countries have made a commitment to international funding of US$100 billion a year from 2020 onwards.

80. On 11 March 2010 the International Conference on the Major Forest Basins was held in Paris, in an effort to consolidate and, if possible, increase the early funding for forestry and climate matters announced in Copenhagen and the national activities based on the REDD+ mechanism announced by developing countries.

81. In a joint communiqué published during the Copenhagen Conference, six states (Australia, France, Japan, Norway, the United Kingdom and the United States) had announced their intention to allocate a collective total of almost US$3.5 billion to REDD+ initial financing for the period from 2010 to 2012, so that activities to combat deforestation could be started immediately.

82. One of the major obstacles to the fight against deforestation is the fact that a living tree is frequently of lower commercial value than a felled tree. The mechanism for Reducing Emissions from Deforestation and Forest Degradation (REDD) is intended precisely to remove this obstacle by assigning a financial value to forestry emissions that have been prevented. The name REDD+ is used when account is taken not only of prevented emissions, but also of forests' carbon storage capacity and the good governance and planning of forests.

83. Several programmes have been set up to finance this mechanism. Among them are:

– The United Nations' Reducing Emissions from Deforestation and Forest Degradation in Developing Countries programme;

– Norway's International Climate and Forest Initiative;

– The World Bank's Forest Carbon Partnership Facility.

84. Australia, France, Japan, Norway, the United Kingdom and the United States have confirmed their joint commitment to the tune of US$3.5 billion for the period from 2010 to 2012, while Germany, Slovenia, Spain and the European Commission have joined this first group of donors.

5. Conclusions and recommendations

85. Present-day problems and the unsatisfactory condition of the planet's forests are the result of a failure to make sound use of forest resources and forest management (in both developed and developing countries), as well as slowness to develop and deploy sustainable forest management techniques (including, first of all, the kind of forest management and forest resource usage which makes it possible to maintain not only forests' productivity, but also their biological functions, aesthetic and recreational value, and landscape and biological diversity).

86. Today, forest fires, illegal logging, diseases and insect activity in large areas pose a great problem for forests. All these negative aspects are directly linked with human activity. It has been established that only 3% of the forest fires recorded each year are of natural origin, while the remaining 97% are caused by human beings.

87. The areas worst affected by forest diseases and insect proliferation are linked with those affected by human activities and not subject to rehabilitation activities.

88. Illegal logging not only has a negative effect in terms of forest destruction, but also has more far-reaching environmental and economic consequences. Such logging is always brutal: no seed trees are left at the logging sites, and the areas concerned are subjected to pollution and uncontrolled growth of mono-dominant communities (loss of biodiversity), lacking any species of no commercial value. Afterwards, these areas usually become very prone to fire (being strewn with debris) and to diseases and insect infestations (mono-dominant communities). It is unsurprising that similar consequences are often seen in areas which have been put to lawful use, but where the loggers subsequently just pretend that they have carried out reforestation activities.

89. All the problems linked to negative conditions in forests stem from the lack of due supervision of forest condition and forest users' activities, and from the differences between and imperfections of forest legislation in various countries.

90. In this context, the following ways of dealing with the problems that exist could be proposed:

– Creation of a committee within an existing organisation (the UN, for instance) to be responsible for the development, adoption and enforcement of legislation designed to preserve and protect forests; development and implementation of sustainable forest management (SFM) techniques.

– Development of international legislation (agreements) on forest protection which are binding on all the countries with significant forest resources which have ratified them.

– Development of proposals for payments in respect of every unit of greenhouse gases, to be centralised by the committee that is to be created and allocated for forest rehabilitation purposes to countries which have forest resources, in proportion to the volumes of greenhouse gases absorbed by their forests.

– Supervision of compliance with the requirements of such new legislation within the committee that is to be created and monitoring of forest condition should be carried out by the international environmental organisations which exist in countries with significant forest resources, and which will be registered (accredited) with the committee that is to be created.