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**Conservation and sustainable
use of tropical rainforests
of Latin America and the Caribbean**

Conservation and sustainable use of tropical rainforests of Latin America and the Caribbean

This document was prepared by the Inter-Agency Technical Committee on the basis of the mandates of the Eleventh Meeting of the Forum of Ministers of the Environment of Latin America and the Caribbean (Lima, Peru, March 1998). The work was carried out by the Mexican Government, through its Ministry of Environment, Natural Resources, and Fisheries (SEMARNAP), and the United Nations Environment Programme (UNEP). The purpose of the document is to provide the Forum with support for discussing and approving courses of action in the sphere of the Regional Action Plan for the period 2000-2001.

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A. Introduction

The Latin American and the Caribbean subcontinent is, biologically speaking, the richest region on Earth. The Latin American rainforests represent the greatest and most significant part of such richness. Therefore, the efforts aimed at conserving their biodiversity must be strengthened, as well as those focussed on using, in a sustainable manner, their enormous economical potential. To efficiently achieve this, it is necessary an improved coordination of agencies and countries around priority issues. The centring of efforts around priorities will allow a more efficient use of the available resources and a greater impact on the very complex realities of the management of natural resources in our countries.

To this end, the Fourth Meeting of the Intersessional Committee of the Forum of Ministers of the Environment of Latin America and the Caribbean (Lima, Peru, October 1999) agreed to concentrate efforts in priority issues and as first priority: the defence of the rainforests of the subcontinent. As a result, this proposal has been drawn, seeking the agreement of a set of issues towards the concentration of efforts aimed at the conservation and sustainable management of tropical rainforests of the region. This document has been prepared by the United Nations Environment Program (UNEP) with the collaboration of the Mexican Secretariat of the Environment, Natural Resources and Fisheries (SEMARNAP).

B. The humid tropic zone in Latin America and the Caribbean

The humid tropic zone of Latin America and the Caribbean is formed by the area currently, or once, occupied by tropical rainforests. Within this broad category can be included several types of vegetation that have a general warm and moist climatic affinity, amongst which stand out the evergreen forest (*tropical rainforest*), but it also includes lowland evergreen forests, cloud forests, montane forests, flood forests (see **Annex I** to the current document). It is estimated that, for the region, these tropical rainforests originally covered close to 100 million hectares, of which, in 1996, remained only, approximately, 49.5 million hectares, meaning that a little more than a half of these ecosystems have already been deforested.

The ecological zone comprises areas in 26 countries and can be divided in 3 major subregions: 1) Mexico and Central America, 2) South America and 3) the Caribbean. Eight provinces can also be seen (see **Annex II** to the current document)

C. Biological, environmental and economical importance of tropical rainforests

Tropical rainforests are the most important land-based ecosystems on Earth and contain the greatest and richest biodiversity of the world, due to the fact that they house an enormous amount of species, from practically all taxonomic groups. In spite of covering only between 6 and 7% of the earth's surface, it is estimated that they house more than 60% of the total species of living organisms. The Latin American rainforests are the most diverse ecosystem of the planet.

In simple terms, the Amazon forest contains close to 90,000 higher plant species, 950 species of birds, 300 species of reptiles and millions of species of insects. In the Lacandona Forest of Mexico, on a comparatively more reduced area, exist 3,4000

species of plants, 508 species of birds, 163 of mammals, and 117 of amphibians and reptiles.

To concentrate efforts on the conservation of tropical rainforests represents an efficient way of achieving the protection of biodiversity in general. The tropical rainforests of Latin America are also important, because of their extension and diversity, since they account for 61% of the world's total surface of this kind of forests and possess a great variability.

Besides, the tropical rainforests have other assets and benefits of great importance, such as:

- a) *Climatic and atmospheric stabilisation.* These forests are very important for carbon storing, because they are a primary factor in the absorption of CO₂ (it is estimated that they absorb one sixth of the CO₂ produced by the burning of fossil fuels), and for oxygen production, reason why they play a very important role in the global carbon cycle and against global warming. It is estimated that their deforestation contributes to an estimate of 25-33% of global CO₂ emissions. The biomass that exists on forests and soil contains up to 100 times more carbon than the crops that replace them.
- b) *Fundamental regulators of the hydric cycle and of mesoclimatic humidity.* The regulatory function of the water cycle of tropical rainforests implies a global importance, since they are an stabilising element of water and climate. The Amazon contains 60% of the world's drinking water. Temperature and humidity are controlled by the vegetation cover, and they contribute significantly to the generation of rain. The evapotranspiration coming from the Amazon forest is responsible for the production of more than half of the rain that falls in the area.
- c) *Hydric regulation in basins and lessening of floods and landslides.* The tropical rainforest cover is an important factor in the regulation of hydraulic flows from watersheds, their existence makes it possible for the water to flow more slowly, and can be more useful for living organisms. Likewise, forest vegetation cover plays a vital role for flood mitigation, which is very important, in view of the disastrous effects that intensive rains and hurricanes can provoke, specially in recent years, when this phenomena have become more intense, as a consequence of global climate change.
- d) *Soil protection and sedimentation control.* The pedogenetic effect of tropical rainforests and their soil protector role are also fundamental, in view that they reduce and control the erosion processes in zones of heavy rain and sedimentation of watersheds, and, particularly, increase the useful life of hydroelectric and other type of dams.
- e) *Source of forest products.* The American tropical rainforests are an immense source of forest products, among which are the traditionally exploited fine woods, like cedar and mahogany, but that also include a great number of species of wood with valuable properties, that have not been fully used. At the same time, the enormous variety of non-wooden products that offer a great economic potential, should be considered.

- f) *Source of wildlife products.* The use of the abundant and diverse wildlife results in an enormous potential, that has not been sustainably exploited, and which may be a source for high income. The regulated and sustainable management of the highly diverse fauna of this ecosystems represents a considerable potential.
- g) *Pharmaceutical products.* It is estimated that currently, the tropical forests provide 32% of the raw materials for the pharmaceutical industry, and that among its biological richness, more than 1,400 plants are active against cancer.
- h) *Tourist and aesthetic value.* This is also very important, since the tropical rainforests are one of the greatest natural beauties, which additionally offer a great potential for ecotouristical activities.

D. The forests and indigenous groups and peasants. Conservation and poverty

The forest areas of the humid tropic of Latin America (and of the world) are, in their majority, territories of many indigenous groups, and small peasant producers, who, despite of the great natural richness that surrounds them, generally live in poverty and extreme poverty conditions. The zones still preserved, are commonly found in the periphery of rural communities of our countries, and coincide with the marginated and poor zones. This coincidence, on one part, is because the natives have survived or have been cornered in the farthest and more isolated areas, where the natural ecosystems have had less impact, and on the other, because the knowledge and the traditional forms of use of natural resources have permitted the existence of important conservation areas. The indigenous and peasant survival strategies have permitted the use of the forests diversity and the management of the regeneration processes in a different way, resulting in that the key ecological functions are maintained and biodiversity is preserved. The destruction of forests is commonly produced with the cultural degradation or the disappearance of these ethnias, which frequently are threatened by outside groups, seeking quick revenues from over-exploitation and waste of the richness of the natural resources of their territories.

The coincidence between the zones of higher biodiversity and conservation, with the poor and marginated indigenous and peasant areas, indicate that the conservation efforts must be carried out in such a way, that conservation is combined with the attention, strengthening, defence and economic, social, political and cultural emancipation of the groups of poor indigenous peasants that inhabit them.

E. Deterioration of tropical rainforests

Notwithstanding its enormous importance, the Latin American tropical rainforests are being destroyed at a considerable pace, and in many regions, the rate of destruction has accelerated more and more in the last years. By far, the greatest extent of existent rainforests is located in South America (445 million hectares), with the Amazon forest, followed by Mexico and Central America, with nearly 48 million hectares, while the Caribbean has only 1.7 million hectares, although with a vast richness of biodiversity, given its island composition.

The behaviour of the destruction process is not equal among countries and regions, but the countries with the highest rate of deterioration are located in the Caribbean and Central America. The rates of deforestation range from very low, like in Surinam

and Guyana, to high, as is the case of Jamaica (5.3%), Haiti (3.8%), Philippines (3.1%), and Costa Rica (2.6%). However, considering the total deforested surface, it is in South America, and specially in the Amazon region, where the highest numbers are found, representing almost half of the whole tropical deforestation in the world (See **Annex III** to the current document). It is estimated that the surface of rainforests lost in the region is around **three million hectares**, of which 2.2 correspond to South America, 720 thousand to Mexico and Central America, and less than 400 thousand to the Caribbean. If this exponential trend behaviour continues, in a few decades we would have completely lost this marvellous ecosystem in the subcontinent. Already in various micro regions and some countries, the tropical rainforest has been so intensively affected, that the small states still surviving, do not have the sufficient size to ensure their genetic viability in the long term, and are, therefore, considered destroyed.

F. Causes and factors of the destruction of tropical rainforests

An **inadequate and disadvantageous articulation between the forests zones and global society** is behind the factors that drive deforestation and the environmental deterioration of the humid tropical zones, which is expressed in a **complex set of articulated causes**, in a process of social and economic expansion that has not been able to integrate the complex ecosystems of the rainforest without destroying them, and without using the many and valuable resources they have.

The general economic growth, and its resulting increase in demand and consumption of products extracted from the humid tropic, is an important factor that presses for more production, which in turn, may also be an opportunity.

Demographic growth in the forests areas is generally high, and in many regions possess a grave pressure on the part of the new land seekers, that has led to strong destructive impacts.

Poverty, in which many natives and peasants live, is a factor leading to the inadequate use of ecosystems, both because it represents multiple limitations for a productive development, and because it reduces the alternatives and promotes the desperate use of natural resources.

Private and/or governmental macroprojects that destroy nature, either through a plundering extraction of forestry resources, or by substituting forests for grasslands or specialised plantations, or by developing projects with serious environmental impacts, such as hydraulic or mining, and in many cases, by invading indigenous and peasants territories and displacing the populations.

The change in land use, mainly the expansion of extensive cattle rising, but also migratory agriculture, is one of the main factors in the destruction of the humid tropic. The expansion of the agriculture border through these agrosystems, substitutes the complex and highly diversified natural tropical systems, by extensive and non-productive agrosystems.

Expansion of cattle raising in humid tropical zones has been, for many countries, a fundamental cause for the destruction of millions of hectares, in the last years.

Migratory agriculture, mainly slash-and-burn, is also a factor. Traditional systems of indigenous and peasant agriculture, that maintain a high diversity, and establish a continuous interaction with the regeneration processes of the forests, and under certain conditions, are ecologically adequate, but with the demographic increases and

pressures for the occupation of cattle raising land and others, many of these systems have destabilised, and also become destruction factors. The use of fire, characteristic of these systems, although is also frequent in extensive cattle raising, is an additional factor to its propagation on reserved zones, in risky meteorological and socio-demographic conditions, and constitutes one of the main causes for forest fires.

Forest fires that result from drought and human carelessness have become, more often, one of the main deteriorating factors. To the socio-demographic and technological factors, the effects of global climate changes have now been added, which seem to increase the frequency and intensity of drought, such as the one of 1998, which affected a great extent of tropical rainforests by fire. During that year, under the influence of a particularly intense phenomenon, "El Niño", the tropical rainforests in Mexico suffered fires in more than 300 thousand hectares, seven Central American countries were affected in 1.2 million hectares and in one state of the Brazilian Amazon (Roraima), the fire affected one million hectares.

Another important factor in the deterioration process is the **inadequate and destructive forest management**. There exists insufficiency in the establishment of sustainable systems for forestry management, and in regulation and control mechanisms that ensure management, without destruction schemes.

The expansion of the urban infrastructure and communications is also an important cause. The lack of ecological criteria in the design and construction of infrastructure brings destructive consequences, both by the direct detriment of occupation of space, as well as by the socio-economic and demographic processes resulting from land use.

The incompetence of the instruments and resources assigned to the protection, conservation and management of forests. Although there exists important efforts to establish and manage protected natural areas, which has resulted in that close to 50 million hectares are protected under some of the main forms of ecological reserves, this is still insufficient, since it represents only 10% of the total surface. Besides, the financial, infrastructure and personnel resources of the reserves, which have undoubtedly been strengthened in the last years, require to be supported more intensively.

Illegal activities, such as the use and illegal trade of wildlife, of zones for drug cultivation, or the territories of guerrilla groups, present a more complicated panoramic, and pose extremely difficult conditions for the development of alternatives.

Public policies and institutional problems. In general, the institutional schemes are found inadequate to address the deterioration problems and establish integral and profound alternatives. A strong centralisation and a sectorial policy are often the case, frequently uncoordinated and not allowing participation from the peasants and natives of the tropical rainforests. It also exists a lack of regional planning schemes for the medium and long term, resulting in giving in plundering visions of the short term. There is also a lack of policies that provide the economic value of the richness, the products, and the environmental services of the zones of the humid tropic.

G. Joint strategies for the conservation of tropical rainforests

1. Concentration of efforts around the conservation of tropical rainforests

Given their ecological importance, their degree of risk, and their essential meaning for the viability of modern development, the tropical rainforests area of the subcontinent deserves the first priority, in an effort to centre and concentrate those international, institutional, and social efforts committed to nature conservation and sustainable development. It is fundamental to define, as a regional priority the objectives, strategies and actions around the defence and protection of tropical rainforests, without undermining the importance of other issues and resources of the Latin American tropics.

In order to achieve a focalised attention that integrates the efforts of different organisations, it is proposed the creation of a **Special Programme for the Conservation of the Tropical Rainforests of Latin America and the Caribbean**, which should be centred on the following overall objective:

To stop the ecological deterioration of tropical rainforests in Latin America and the Caribbean, and to improve the use of natural resources in the humid tropics, in order to contribute to a major economical growth and to the social improvement of critical micro regions on the frontiers or buffer zones, or neighbouring areas, or deterioration fronts, through a comprehensive sustainable development regional programme, that integrates various institutional and social policy instruments.

2. Focalisation of efforts in priority micro regions (still conserved relicts and deforestation fronts)

The effectiveness of an integrated policy around the objective of the conservation and sustainable use of tropical rainforests would be greater if it could be distinguished from the total geographical universe of the humid tropic's region, those micro regions, where integral attention is urgent and more important, because they constitute the only remaining forest massifs that urgently need to be conserved, or because these micro regions are located on the current deforestation fronts (paths). The identification of these priority micro regions, and the concentration of efforts on them, constitute the basic strategy to improve the outreach of policies for promoting sustainable development.

3. Focalisation of efforts within the micro regions in communities and settlements that border conserved areas

A third focalisation effort is additionally proposed, so that within each of the priority regions, the coordinated actions can be carried out at the settlements bordering conserved areas, where the process of transforming the forest frontier into agricultural and cattle-raising uses is taking place, and in the communities located at the limits or buffer zones of reserves, or in areas where the tropical rainforest is still conserved.

4. Regional approach through integrated plans for conservation, use of natural resources and sustainable development in priority micro regions. Integration of conservation and development policies

In view that the root of the problem is made up of an inadequate, and less than advantageous relationship between the humid tropic regions and global society, it is

therefore required a profound restructuring of such relationships. The multiple and complex character of the causes and factors of environmental destruction makes it necessary to have an integrated and multisectorial approach. Thus, it is proposed the use of an integrated, decentralised and sustainable micro regional planning approach, that can bring together conservation and development policies, encourage interinstitutional coordination, be strongly participative and decentralised, and tackle in an integrated manner the complex problems of conservation and sustainable use. Many planning models, such as this, have been developed, with considerable success, in countries like Bolivia, Colombia, Mexico, and Venezuela.

It is proposed the elaboration of regional-integrated plans for the conservation, management of natural resources and sustainable development, with a medium and long term vision, that include, as an essential issue, ecological conservation, along with social and economical improvement, and these plans should be the result of a micro regional agreement on the future, wished and shared by the focalised zone.

5. Interinstitutional coordination and social participation

In view of the fact that the conservation of tropical rainforests requires an integrated strategy that addresses different causes and factors, it is necessary that the diverse organisations, including both, international and the different governmental levels of the different countries, achieve a coordinate action to join forces and resources around the objectives and goals reconciliated with the population. It is, therefore, necessary the existence of a tight interinstitutional coordination, that allows the incorporation of the different sectors. This institutional integration should be accompanied by an intensive and inclusive participation of civil society in the micro regions, in the main decisions for sustainable development, including budgetary decisions, conservation and development decisions. In the way the inhabitants of priority micro regions start participating, democratically, in defining the policies for managing natural resources, the wisdom of those people, who have a profound knowledge of the forest, will allow to identify better alternatives. It becomes of the utmost importance, for forest conservation, the creation of platforms in which interinstitutional relations can be achieved, with a complete and legitimate participation of society, in which agreements are reached on the long term objectives and strategies, and at the same time, actions should be programmed, followed up, and assessed during each year.

Therefore, it will be encouraged the creation of councils, committees, commissions or any other necessary bodies, in which both, the institutions and social organisations are represented, in order to plan the sustainable development of each priority micro region.

6. Strategic lines integrated into a micro regional plan on the basis of ecological planning

The conservation and management programme, for each target zone, should include ecological and territorial planning, which should be the special expression of integrated policies, and clearly establish the protected areas and the ones for conservation, and indicate also in which areas can productive activities and economical development be created and expanded. The geographical identification, in each micro region, of potentials and environmental risks, allows for a resource management strategy and provides a series of environmental and social guidelines, to be included in the different sectors.

The micro regional strategy should integrate a number of programmes and instruments, ranging from pure conservation, as it should exist in core areas, to those

areas with a greater transformation level, such as agricultural area. The strategy should integrate the following issues:

a) Creation and strengthening of Natural Protected Areas

In spite of having a considerable extension of ecological reserves, it is necessary to strengthen the efforts for creating new natural protected areas, in order to guarantee a larger protected surface. Regarding this issue, it is worth mentioning a major need for budgetary and logistical strengthening of existing protected areas, since it is necessary for them to have more financial resources, personnel, infrastructure, equipment, and other resources that allow a more effective protection.

b) Ecotourism

Given the increased landscape and aesthetic value of tropical rainforest, one of the best alternative uses, with high economic revenues, and reduced destructive impact, are ecotouristical activities. There exists several successful experiences, in different parts of the region, that could be shared and disseminated.

c) Biological corridors

The isolation of many ecological reserves and conservation areas, caused by the fragmentation process, is a grave threat for the biological viability of many species that require large extensions of land, thus reducing the conservation efficiency of small patches. Therefore, it is very important to establish biological corridors, between the conserved massifs, by promoting sustainable uses. That require larger vegetation covers, between the different reserves and conservation areas. For example, the Mesoamerican Biological Corridor initiative could be an important experience to be taken into account for other areas.

d) Protection against forest fires

Cooperation on these issues is fundamental, for allowing a better preparation against this serious threat, especially for anticipating the risks of experiencing severe drought years. It is extremely important to create programmes that prepare society, as a whole, for facing forest fires, and to give special emphasis to preventive measures.

e) Sustainable use of wildlife

The sustainable and controlled use of the enormous wildlife resources of tropical rainforests is, undoubtedly, one of its greatest economic potentials. It is required to encourage the creation of approaches that ensures the sustainability of this use, regulates their high illegal use, and strengthens the integration of productive chains to allow the knowledge, management, processing, and commercialisation of these goods, ensuring their conservation, and seeking that the earnings benefit indigenous people and peasants.

f) Sustainable forest use

The achievement of non-predatory ways for the use of the forestry resources of tropical rainforests, either wooded or non-wooded, is also one of the most important alternatives for their conservation. It is necessary to have better regulatory schemes and control of forest produce, and to develop better alternatives of forestry certification, as well as the vertical integration of these activities, which require specific technology, and unique marketing schemes. There already exist important successful

experiences, at a pilot level, in the sustainable management of tropical rainforests, which could be disseminated to all the priority regions.

g) Environmental restoration

Actions aimed at the environmental restoration of tropical rainforests are very important, since they represent instruments against the deterioration process. However, given the ecological complexity of these ecosystems, these tasks are highly difficult. The building of capacities to handle a great number of species of the tropical rainforests, the establishment of restoration areas that link conservation areas, and learning about the mechanisms to handle the natural regeneration processes, are some of the important issues that must be included along this subject.

h) Carbon sequestering

The importance of deforestation of tropical rainforests in the generation of carbon emissions, and other greenhouse gases, make the actions aimed at marketing, the result of conservation programmes in priority regions, an important instrument. Income derived from this concept, may be significant complement for a sustainable use, through other means. It is necessary to disseminate the experiences that some countries in the region have had, in order to train the micro regions in the preparation and implementation of this type of projects, to take advantage of the opportunities that will open in the future.

i) Sustainable commercial forestry plantations

The encouragement of commercial forestry plantations in the areas occupied today by extensive cattle raising, may be important means for the production of forestry goods, without affecting the native forest, if and when a diversification of species is used, preferentially native, and corridors and natural vegetation buffer zones are included, ensuring that natural ecosystems are not substituted with plantations.

j) Sustainable agriculture and agro-ecological conversion

In view that the change in land use, as well as forest fires, which are fundamental threats for forest ecosystems, are caused by agricultural and cattle-raising activities, the transformation of these practices, through the use of agro-ecological technological models, is one of the most important measures for forest conservation.

The stabilisation of migratory agriculture, and the elimination of the use of fire, through the use of a leguminous cover, is a measure utilised successfully, in many countries of the region, as a powerful tool of agricultural transformation, that strongly reduces the area occupied by slash and burn systems, and eliminates the use of fire. At the same time, the intensification of pasture cattle-raising, permits the removal of important quantities of soil, and strongly reduces the pressure on preserved forests. Also, the transformation of tropical plantations to agroforestry, sustainable and organic models are adequate measures.

k) Education, training and strengthening of civil society

Encouragement to participate and support the development of peasant communities and indigenous peoples of the priority zones, requires of a strengthening process of their local capacities, through a community education and training approach, including as well, all institutional and social actors. A profound respect and support to the local cultures, education, and training may improve the community management and

planning capacities, recover traditional knowledge, and support alternative technologies for the management and conservation of natural resources. To this effect, an educational and training pilot project has been designed at a regional level, which has begun its implementation in the communities of the Mexican tropical rainforests.

**I) Basic investigation, creation of technology.
(Tropical rainforests ecology, biology of their conservation)**

The joint impulse for the basic investigation and creation of alternative technologies for the conservation and management of the tropical rainforests is a priority. Improving productivity and income, as well as assuring conservation of these ecosystems, will be accomplished as major scientific and technical knowledge, about its basic use and possibilities for its sustainable use is held.

7. Special Attention to indigenous and peasant communities

In view of the tight relationship between many of the region's native cultures with tropical rainforests, environmental conservation is strongly linked with the defence of indigenous and peasant societies, thus requiring actions directed specially towards the interests of these people. The defence of their territories, in some cases, or the certification of their property rights, in other cases, are measures tightly related to forest protection.

8. Monitoring the deterioration process

A rigorous monitoring of deterioration processes is a fundamental element for the defence of tropical rainforests. In spite of the fact that monitoring efforts at a global level are constantly strengthened, and there is a very good overview about the situation of these ecosystems, we still lack the capacities to know in greater detail the ways and rates of ecological destruction. There is also a lack of linking processes between the planning, realisation and assessment of development actions, on one side, and the effects these actions are causing on the conservation of tropical rainforests. Therefore, it is important to strengthen the institutional capacities for environmental monitoring and assessment of public sustainable development policies at the subcontinent level and in each country and micro region.

9. Horizontal involvement of actors. Creation of exchange networks

The programme should not turn into a vertical structure, but be very swift and vertical; in order to operate as the integrating force of the different institutions and efforts, at all levels, by concentrating the efforts around clear priorities. Therefore, involvement networks should be encouraged throughout the subcontinent in order to allow the exchange of experiences between technicians, leaders, officials, company owners, indigenous and peasant representatives, scientists, NGOs and other actors.

H. Actions proposed 2000-2001

- a) ***Inclusion of the Programme into the activities of the Inter-Agency Committee:*** The following up of the programme by the Inter-Agency Committee should be included, as a fundamental issue, so that the committee can function as a compiler of efforts around the defined priority.
- b) ***Preparation of the ruling document*** for the Latin American Programme for the Defence of Tropical Rainforests (August 2000). On the basis of the approval by the ministers of this proposal, a more detailed and complete document will be prepared, which will include a greater elaboration of objectives and targets seeking the detailed integration of programmes and actions.
- c) ***Definition of priority micro regions in the countries (August 2000):*** Each country must select the priority micro regions for the conservation and sustainable use of tropical rainforests. Likewise, a comprehensive plan must be prepared for each area.
- d) ***Celebration of three subregional meetings and one Latin American meeting,*** for the exchange of experiences and methodologies. October 2000 to February 2001 for the subregional ones, and March 2001 for the regional meeting.
- e) ***Creation of a tropical rainforest monitoring network.*** To concentrate efforts and share the experiences and methodologies of international organisations, and of each country, in order to have more relevant information for knowing, more precisely, the deforestation process of the humid tropics, focussing on priority areas. (Preparation in May 2000; presentation of the first report in October 2000).

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Annex I

Estimated rates of the types of vegetation in the tropical rainforest

Rzedowski	Ruebel (1930) The World	Leopold (1950) Mexico	Miranda (1951) Chiapas	Beard (1955) Tropical America	Miranda y Hernández X. (1963) Mexico	Lauer (1968) Central America	Unificada de WCMC (1997)
Evergreen tropical forest	pluviisilvae	rainforest tropical evergreen forest	evergreen, highland rainforest	rainforest evergreen seasonal forest	evergreen, highland rainforest perennifolia evergreen rainforest subperennifolia	evergreen umbrella rainforest	montane rainforest, lowland rainforest. submontane rainforest
Montane forest	aestisilvae (some parts) laurisilvae (some parts)	cloud forest	deciduous forest evergreen lowland rainforest	montane rainforest elfin woodland	evergreen, lowland rainforest perennifolia caducious forest (some parts)	evergreen umbrella and montane forest highland umbrella forest	
Aquatic and subaquatic vegetation	emersiherbosa subemersiherbosa, pluviifruticeta		mangrove	swamp vegetation (some parts)	mangrove; popal; tulares, carrizales, etc.; caduceus forest (some parts)		mangrove

Source: FAO. State of the World's Forests, 1999.



Annex II

Tropical rainforests of Latin America and the Caribbean



Source: Secretaría de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP), 1999

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Annex III

Total area and percentage of protected rainforests, by country and by subregion

Region	Country	Total Area (Km2)	Protected Areas (Km2)	Protected % of the Total Area	Annual % of Deforestation 1981-90 (WRI)
Mexico and Central America	Mexico	206,693	15,197	7.35	1.0
	Belize	12,874	5,719	44.42	
	Guatemala	36,305	12,310	33.90	1.6
	El Salvador	134	26	19.40	2.0
	Honduras	17,444	4,020	23.04	2.0
	Nicaragua	41,940	12,663	30.19	1.7
	Costa Rica	11,343	4,495	39.62	2.6
	Panama	33,533	9,882	29.46	1.6
Subtotal		360,266	64,312	17.85	
Caribbean	Cuba	5,532	415	7.50	
	Haiti(**)	638	13	2.03	3.8
	Dominican Republic	1,917	438	22.84	2.5
	Jamaica	2,783	622	22.35	5.3
	Barbados(**)	3	0	0	
	Puerto Rico(**)	1,870	66	3.53	1.7
Subtotal		12,743	1,554	12.19	
South America	Colombia	502,232	53,006	10.55	0.4
	Venezuela	440,430	282,900	64.23	0.7
	Guyana	85,632	634	.74	
	Suriname	123,576	4,840	3.91	
	French Guiana	79,003	0	0	
	Ecuador	130,464	31,995	24.52	1.7
	Peru	745,513	38,083	5.10	0.3
	Brazil	3,002,446	205,870	6.85	0.3
	Bolivia	392,299	67,622	17.23	
	Paraguay	45,977	1,880	4.08	
	Trinidad & Tobago	1,235	86	6.96	
Subtotal		5,548,807	686,916	12.38	

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(*) Lowland evergreen broadleaf rain forest, Freshwater swamp forest, Upper montane forest, semi-evergreen moist broadleaf forest.

(**) Only semi-evergreen moist broadleaf forest.