UNITED NATIONS
NATIONS UNIES

FRAMEWORK CONVENTION ON CLIMATE CHANGE - Secretariat
CONVENTION - CADRE SUR LES CHANGEMENTS CLIMATIQUES - Secrétariat

Working paper No. 1 (d) (2006) 23 August 2006

Workshop on reducing emissions from deforestation in developing countries

30 August – 1 September 2006, Rome, Italy

BACKGROUND PAPER FOR THE WORKSHOP ON REDUCING EMISSIONS FROM DEFORESTATION IN DEVELOPING COUNTRIES

Addendum 2 - Part 1

Synthesis of submissions by Parties on issues relating to reducing emissions from deforestation in developing countries*

CONTENTS

* This paper has not been subjected to editing. The information synthesized in this paper relates to the topics addressed in part I and part II of the workshop's background paper (see also topics listed in paragraph 52 (a) and (b) of document FCCC/SBSTA/2006/5).

I. Introduction

A. Mandate

1. The Conference of Parties (COP), at its eleventh session, invited Parties and accredited observers to submit to the secretariat, by 31 March 2006, their views on issues relating to reducing emissions from deforestation in developing countries, focusing on relevant scientific, technical and methodological issues, and the exchange of relevant information and experiences, including policy approaches and positive incentives. The COP also invited Parties to submit recommendations on any further process to consider the issues. It requested the secretariat to compile the submissions from Parties in a miscellaneous document and to post those from accredited observers on the UNFCCC website.[1]

2. Twenty-one submissions were received representing the views of 68 Parties, of which 39 were from Parties included in Annex I to the Convention (Annex I Parties) and 29 from Parties not included in Annex I to the Convention (Non-Annex I Parties). These submissions by Parties are contained in document FCCC/SBSTA/2006/MISC.5 and Add.1. In addition, four submissions were received from intergovernmental organizations (IGOs) and another thirteen submissions from non-governmental organizations (NGOs). These submissions by accredited observers are posted on the UNFCCC website.[2] A list of Parties and accredited observers that provided submissions on this issue are given in Tables 1 and 2 respectively.

3. The Subsidiary Body for Scientific and Technological Advice (SBSTA), at its twenty-fourth session, initiated consideration of the information in the submissions. It decided to continue the consideration of relevant scientific, technical and methodological issues and the exchange of relevant information and experiences, including policy approaches and positive incentives, at its twenty-fifth session, taking into account the outcome of the workshop requested by the COP, at its eleventh session, and the submissions by Parties.[3]

B. Scope of the synthesis of submissions

4. The SBSTA, at its twenty-fourth session, also requested the secretariat to prepare for the workshop a background paper on the items contained in paragraph 3 (a) and (b) of the introduction to this background paper, working paper No. 1 (2006) – (see also paragraph 52 (a) and (b) of FCCC/SBSTA/2006/5), with a synthesis of relevant information in national communications and the submissions referred to in paragraph 2 above.[4] This synthesis is included as addendum 2 to the background paper and is divided into two parts to cover submissions from Parties and submissions from accredited observers, respectively. The other parts are contained in part I, part II and addendum 1 of the background paper.

5. In preparing this synthesis of information from the submissions, the secretariat attempted to ensure a comprehensive coverage of the information provided by Parties, but priority was given to information relevant to the topics outlined for the workshop's background paper (see paragraph 3 (a) and (b) of the introduction to the background paper (working paper no. 1 (2006)). To the extent possible, this information was organized in two separate sections according to those topics, i.e., this synthesis is broadly divided into two main aspects:

(a) Scientific, socio-economic, technical and methodological issues;

---

[1] FCCC/CP/2005/5, paragraph 81.

[2] For submissions from IGOs see <http://unfccc.int/parties_and_observers/igo/items/3714.php> and for those from NGOs see <http://unfccc.int/parties_and_observers/ngo/items/3689.php>.

[3] FCCC/SBSTA/2006/5, paragraph 51.

[4] FCCC/SBSTA/2006/5, paragraph 54.

(b) Policy approaches and positive incentives to reduce emissions from deforestation in developing countries.

6. In this regard it should however be noted that the synthesis reflects terms and terminology as used by Parties in their submissions, including the broad grouping of the issues, which may not necessarily match the terms of topics and their grouping as listed in paragraph 52 (a) and (b) of document FCCC/SBSTA/2006/5. The coverage and depth of the information in this synthesis vary across topics in accordance with the information available in the submissions, particularly in the submissions by Parties.

7. Views expressed in submissions referring to guiding principles and process in the context of the UNFCCC are not covered by this synthesis, as these aspects are neither referred to specifically under scientific, socio-economic, technical and methodological issues nor under policy approaches and positive incentives to reduce emissions from deforestation in developing countries. However, annex I to this addendum provides a summary overview of the views that Parties have expressed on this matter and where such information can be found.

8. Due to the need to provide comprehensive information on specific experiences and lessons learned, information on national experiences provided by several Parties in their submissions has not been synthesized but has been reproduced in whole and included in annex II of this synthesis. This information is also relevant when considering the other parts of this background paper.

9. Key points made in the submissions, where applicable, are provided for each issue or view. Where similar issues or views were raised, these were synthesized as one issue or view. Due to the inter-linkages between some of the issues raised in the submissions, some overlaps may occur. In such cases, the issues are generally reflected only once. For the full details, the reader will have to refer to the original submission(s).

10. In each of the above cases, the secretariat has made every effort not to alter the meaning of the views expressed by the Parties or observers by keeping as closely as possible to the original text.

11. For the sake of brevity, submissions made by Parties on behalf of a group of countries and/ or supported by other countries are referred to as follows in this synthesis:

- Submission by Austria on behalf of the European Community and its Member states, and supported by Bulgaria, Romania, Croatia, Albania, Bosnia and Herzegovina, Serbia and Montenegro, former Yugoslav Republic of Macedonia and Turkey is referred to as ‘EC and its Member States’

- Joint submission by Bolivia, Costa Rica, Nicaragua and Papua New Guinea, and supported by the Central African Republic, the Dominican Republic and the Solomon Islands is referred to as ‘Bolivia, Costa Rica, Nicaragua and Papua New Guinea’

- Submission by Gabon on behalf of Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of the Congo, Gabon, and Equatorial Guinea is referred to as ‘Gabon on behalf of seven countries of the Congo Basin’

- Submission by Panama on behalf of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama is referred to as ‘Panama on behalf of six countries of Central America’

- Submission by Peru on behalf of Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama and Peru, and supported by Bolivia, is referred to as Peru on behalf of eight countries of Latin America. This includes the submission of Uruguay, which noted in its submission that Uruguay belongs to the group of countries whose views were submitted by Peru on their behalf.

Table 1. Submissions by Parties on issues relating to reducing emissions from deforestation in developing countries

Submission by	On behalf of * / Supported by **
Australia	
Austria	* On behalf of the European Community and its Member states ** Supported by Bulgaria, Romania, Croatia, Albania, Bosnia and Herzegovina, Serbia and Montenegro, former Yugoslav Republic of Macedonia and Turkey
Bolivia	
Bolivia, Costa Rica, Nicaragua and Papua New Guinea	** Supported by the Central African Republic, the Dominican Republic and the Solomon Islands
Brazil	
Chile	
Costa Rica	
El Salvador	
Gabon	* On behalf of Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of the Congo, Gabon, and Equatorial Guinea
Indonesia	
Japan	
Malaysia	
Morocco	
New Zealand	
Norway	
Panama	*On behalf of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama
Peru	* On behalf of Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama and Peru ** Supported by Bolivia
Republic of Korea	
Switzerland	
Uruguay	(among the group of Latin American countries whose views were submitted by Peru on their behalf)
United States of America	
Total submissions	**21**
Total number of Parties	**68**

Table 2. List of accredited observers that provided submissions

IGOs
• United Nations Convention to Combat Desertification (UNCCD) • Food and Agriculture Organization of the United Nations (FAO) • Global Terrestrial Observing System (GTOS) • Center of International Forestry Research (CIFOR)
NGOs
• Climate Action Network International (CAN) • Conservation International (CI) • Centre for International Sustainable Development Law (CISDL) • Environmental Defense • Friends of the Earth International (FoEI) • Fundacion Amigos Naturaleza • Goteborg University • Amazon Institute for Environmental Research (IPAM) • Joanneum Research • Sierra Club of Canada • The Nature Conservancy (TNC) • Vitae Civilis Institute for Development, Environment and Peace • Woods Hole Research Center (WHRC)

II. Scientific, socio-economic, technical and methodological issues

A. Overview

12. This section focuses on scientific, socio-economic, technical, and methodological issues, including the role of forests, in particular tropical forests, in the global carbon cycle; definitional issues, including those relating to links between deforestation and degradation; data availability and quality; scale; rates and drivers of deforestation; estimation of changes in carbon stocks and forest cover; and related uncertainties, as addressed in submissions by Parties.

13. Due to the inter-linkages of some of the above listed items, including the close relationship to some issues related to policy approaches and positive incentives, as well as the grouping of issues used by Parties in their submissions, the structure of the present section may not in all instances follow the above list of items; in addition, for practical reasons, terminology used and topics included in this part of the synthesis generally corresponds to that used by Parties. Coverage and level of detail on the above items vary depending on the information provided in the submissions.

14. Almost all submissions included information relevant to any of the issues referred to in paragraph 12 above. A large number of submissions contained a specific section on scientific, technical and methodological issues, in which Parties expressed views on topics such as monitoring, quantification, reporting and accounting; methodologies to estimate deforestation, definitional issues, data availability and quality; scale, baselines/reference scenarios, additionality, leakage and permanence. Some Parties also informed on the causes for deforestation and provided detailed data on deforestation rates and related forestry information, which was frequently the case for Parties which provided information on national experiences. Needs for addressing the methodological and technical issues, i.e. in terms of resources and/ or capacity building were also highlighted in some submissions, as were scientific aspects related to deforestation, which in many cases were based on findings from the Intergovernmental Panel on Climate Change (IPCC) and literature.

B. Scientific aspects

15. The role of tropical forests in the global carbon cycle as a large carbon reservoir and the multiple functions, benefits and values of forests as a source of goods and services was recognized by many Parties. Similarly, the significant contribution from deforestation and land clearing to anthropogenic global CO_2 emissions was also frequently highlighted. Parties referred to a number of scientific findings, often quoting from relevant IPCC reports, such as the IPCC Third Assessment Report (TAR), the 2000 IPCC report on *Land Use, Land-use Change, and Forestry*, and other studies.

16. Costa Rica highlighted that although tropical forests account for less than half of the global forest area, trees in tropical forests hold about 50 per cent more carbon per hectare than in temperate forests. Also Gabon on behalf of seven countries of the Congo Basin[5], and the joint submission by Bolivia, Costa Rica, Nicaragua and Papua New Guinea[6] noted that the tropical biome, though it covers only 10 per cent of the planet's land surface, contains 25 per cent of all terrestrial carbon in plants and the soil, and the United States of America refers to studies according to which tropical forests are among the world's largest terrestrial carbon reservoirs, indicating that tropical forests account globally for 11.6 per cent of the world's land area, 45.5 per cent of the carbon stored in vegetation, and 11.7 per cent of the carbon stored in soils.

17. Parties also provided information on the multiple other functions and benefits of tropical forest ecosystems as a source of goods and services, including the economic and environmental linkages between forests and local communities, such as timber, fuel wood, food, medicinal plants, shelter,

[5] Cameroon, the Central African Republic, Chad, Congo, the Democratic Republic of the Congo, Gabon, and Equatorial Guinea.

[6] Supported by the Central African Republic, the Dominican Republic and the Solomon Islands.

livelihood and employment, and conservation of biological diversity, regulation of the water cycle and soil conservation, as noted by, for example, Switzerland and the United States. Furthermore, Parties noted the importance of the world's tropical forests for biodiversity, given that more than half of the world's the species known to exist - including endangered species and species essential to medical research, are harboured in tropical forests, which provide humankind a variety of benefit and value (Bolivia, Costa Rica, Nicaragua and Papua New Guinea; United States). Similarly, intact forests and species harboured in tropical forests help maintain the resilience of diverse ecosystems and to cope with a changing climate (Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Gabon on behalf of seven countries of the Congo Basin). El Salvador notes the potential of adaptation measures for reducing climate related losses in agriculture and forestry.

18. As regards the significance of deforestation as a major source of global greenhouse gas (GHG) emissions, most Parties quoted findings from the IPCC, according to which 10-25 per cent of annual global anthropogenic emissions in the 1990s were caused by land-use changes, dominated by tropical deforestation in developing countries (Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Costa Rica; Gabon on behalf of seven countries of the Congo Basin; Norway). The United States refer to studies which established that the clearing of tropical forests accounts for at least 20 per cent of all anthropogenic CO_2 emissions (or 5.9 Gt of CO_2 per year). In addition, Bolivia, Costa Rica, Nicaragua and Papua New Guinea; and Gabon on behalf of seven countries of the Congo Basin noted the following additional threat of deforestation for climate stability: deforestation destroys ecosystems that are sequestering CO_2 already in the atmosphere, and deforestation alters historical land surface conditions that modulate global climate and weather patterns. Norway also refers to finding from the IPCC TAR and quoted projected increases in CO_2 concentrations. Costa Rica further noted that deforestation in developing countries - typically tropical deforestation - is currently the major source of emissions from these countries. If current trends continue, tropical deforestation would release 50 per cent as much carbon to the atmosphere as has been emitted from the combustion of fossil fuels since the start of the industrial revolution.

19. According to Panama on behalf of six countries of Central America[7], between 1990 and 2000 GHG emissions from global deforestation ranged between 10 and 38 per cent of total anthropogenic emissions, including activities of forest conversion in farm and cattle land, migrating agriculture and forest crops. In Central America, biomass reserves have evidenced a progressive decrease in the last years, related to different processes, such as deforestation. The total regional biomass stock decreased from 1990 of 3.4 Gt, to 2.9 Gt in 2000, and 2.7 Gt in 2005.

20. Uruguay referred to the relevance of forest cover reduction and loss of carbon density through forest degradation for the global carbon cycle, and further remarks that deforestation and forest degradation is not only a phenomenon of tropical regions but affecting also countries with other climate conditions.

21. Panama on behalf of six countries of Central America as well as El Salvador highlighted various findings from relevant IPCC reports (e.g. the SAR and TAR), which describe the projected impacts of climate change on ecosystems, including on forests and their growth and regeneration capacity, and the potential decrease in productivity, increase in soil degradation and losses of carbon stored or decrease in the rate of carbon uptake due to changes in the frequency of extreme events. El Salvador further noted that impacts of climate change on forest ecosystems will be one of the causes of emissions from deforestation.

C. Drivers and rates of deforestation

22. Many Parties recognized the multiple and complex causes of deforestation in developing countries, which vary both within and across countries and regions, and frequently highlighted socio-

[7] Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama

economic and/or cultural reasons as important drivers for deforestation (Chile; Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Gabon on behalf of seven countries of the Congo Basin; Peru on behalf of eight countries of Latin America,[8] United States). Similarly, the EC and its Member States[9] noted that deforestation is the result of a number of interlinked national and international factors, which are complex, operate over different spatial and temporal scales, vary in importance among nations and regions, and have a socio-economic context. In addition, the joint submission by Bolivia, Costa Rica, Nicaragua and Papua New Guinea noted that deforestation rates are further intensified by poverty and by the existing system of perverse international market incentives for agriculture, timber production, energy sources, infrastructure, etc.

23. Most Parties also emphasized the need of recognizing the differences in national and regional circumstances and specificities, including national priorities and programmes (Australia; Gabon on behalf of seven countries of the Congo Basin; Indonesia, Malaysia, Morocco, Uruguay, and the United States). Given this background, the need for reviewing and understanding the causes and drivers of deforestation as well as scale, drivers and patterns of forest cover change and the importance of national circumstances, including economic and social aspects, was highlighted by many Parties. For example, Chile, Gabon on behalf of seven countries of the Congo Basin, and Peru on behalf of eight countries of Latin America noted that any action or measure pursuing the control of emissions from deforestation should take into account these national and regional specificities. As noted by Australia, responses and measures to address deforestation may differ depending on the causes of deforestation, e.g. land clearing for agricultural purposes and logging for timber, or, as illustrated by Japan, in cases where unsustainable deforestation occurs by collecting firewood, firewood may be replaced by fossil fuels, while emission from combustion of fossil fuels would increase.

24. Malaysia noted that rates of deforestation/forest degradation need to be viewed from a holistic perspective i.e. taking into consideration the root causes and impacts, and suggested that, in assessing current conditions and activities, a historical perspective would provide a more balanced consideration of the issue.

25. For the region of Central America and Central Africa, reasons for deforestation were illustrated as follows:

• "In Central America, deforestation is due mainly to land use change (expansion of the agricultural frontier, firewood consumption and urban processes). Focusing on the causes of deforestation and looking for solutions that take into account the socio-economic context are therefore essential for the success of this initiative." In addition, data on deforestation rates and other related information were provided for Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama (see annex II under country experiences of Panama on behalf of six countries of Central America)
• "In the context of Central African countries, reduction/ destruction of forest cover followed by land use change is a consequence from the extreme poverty of populations and is relatively limited compared to other regions of the world. However, degradation resulting from uncontrolled commercial logging is an important phenomenon that could affect around 60 per cent of the total productive area of Congo Basin forests" (Gabon on behalf of seven countries of the Congo Basin)

26. The country experiences provided by Bolivia, Nicaragua and Papua New Guinea included detailed information and data on deforestation rates and drivers, indicating as main principal drivers for the observed deforestation rates population growth, land use change to crop production, cattle ranching and large-scale commercial agriculture, subsistence agriculture (slash and burn), forest fires, forest

[8] Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama, Peru, and Uruguay, supported by Bolivia
[9] Supported by Bulgaria, Romania, Croatia, Albania, Bosnia and Herzegovina, Serbia and Montenegro, former Yugoslav Republic of Macedonia and Turkey

logging and illegal logging, and new settlements and infrastructure development, among others (for further details see annex II under country experiences from these countries, respectively).

D. Technical and methodological issues

1. General technical and methodological considerations

27. In addressing technical and methodological issues, most Parties provided views on general as well as on specific topics to be addressed in the consideration of reducing emissions from deforestation in developing countries. Broadly, the following key methodological and technical topics have been identified:

• Monitoring/verification, measuring, quantifying, reporting and/or accounting, data availability and quality (Australia; Bolivia; Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Costa Rica; EC and its Member States; Gabon on behalf of seven countries of the Congo Basin; Indonesia; Japan; Morocco; New Zealand; Norway; Panama on behalf of six countries of Central America; Republic of Korea; Switzerland; United States)
• Definitions (Australia; Chile; Bolivia; Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Peru on behalf of eight countries of Latin America)
• Issues related to scale (Australia; Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Costa Rica; Gabon on behalf of seven countries of the Congo Basin; Indonesia; Peru on behalf of eight countries of Latin America; Republic of Korea)
• Baselines/reference scenarios, additionality, leakage and permanence (Bolivia; Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Costa Rica, EC and its Member States; Gabon on behalf of seven countries of the Congo Basin; Indonesia; Japan; Morocco; New Zealand; Norway; Peru on behalf of eight countries of Latin America)

28. With regard to the above, Parties expressed the following general considerations:

(a) Any approach to address deforestation should be based on sound, robust and transparent methodologies and a comprehensive set of definitions (EC and its Member States)

(b) Considering the magnitude and complexity of efforts necessary to achieve meaningful actions to curb GHG emissions from deforestation, technological and methodological issues may need to be 'flexible' in order to allow voluntary implementation at the project, national and/or regional scale (Bolivia, Costa Rica, Nicaragua and Papua New Guinea)

(c) Actions to curb GHG emissions from deforestation should be implemented at the project level; a project may be implemented up to the regional or national scale (Chile; Costa Rica; Peru on behalf of eight countries of Latin America)

(d) The need to building a technical understanding of changes in forest cover and land use, including their effect on GHGs was also expressed (e.g. Australia)

(e) The need to consider national circumstances in methodological approaches was frequently mentioned (see also section C. above)

(f) Addressing the technical issues necessary to track and report emissions related to deforestation and forest change are anticipated to be complex (United States)

(g) Methodological and technical issues such as the establishment of baselines to determine avoided deforestation as well as monitoring and verification issues could be problematic; the issue of leakage, additionality and permanence would also need to be explored and adequately addressed to ensure that solutions to deforestation are durable, and have environmental, scientific and economic integrity (New Zealand)

(h) The possible scale of supply of GHG from avoided deforestation that affect carbon prices and costs need to be addressed (Republic of Korea).

29. A large number of Parties recognized the existence of methodologies to address technical issues, such as those arising from the scale of implementation (e.g. leakage, monitoring, etc.), which could be adapted as necessary (Chile; Gabon on behalf of seven countries of the Congo Basin; Peru on behalf of eight countries of Latin America). New Zealand, while noting that methodological and technical issues can be problematic, it noted that the UNFCCC has built up considerable expertise on these issues over recent years, including as part of the methodological approval process for the Clean Development Mechanism (CDM). The EC and its Member States also noted that some methodological elements, such as baselines, additionality, leakage and permanence have already been addressed in the context of the CDM, which, in exploring options for achieving effective action to reduce emissions from deforestation in developing countries, should be reconsidered as far as they are applicable. Japan noted that consistency with current systems, such as the CDM, would require consideration.

30. Many Parties also expressed to the need for exchanging national experience, such as on managing forest resources (Australia). Switzerland highlighted the usefulness of collecting existing experience and know-how on technical issues aimed at reducing deforestation through sustainable forest management. The United States noted that the complex factors governing land use and land use change (see section C. above), as well as differences in national circumstances and policies, suggest the need for Parties to exchange views and experiences on a wide variety of technical and policy issues.

2. Definitional issues

31. Though not mentioned in the context of definitional issues, a number of Parties clarified their understanding of "deforestation" in the context of their submissions in the following terms: "Deforestation should be understood as a process leading to emissions of greenhouse gases due to human activities" (Chile; Gabon on behalf of seven countries of the Congo Basin; Peru on behalf of eight countries of Latin America). The submission of Gabon on behalf of seven countries of the Congo Basin further distinguishes the following two situations for deforestation:

- Reduction / destruction of forest cover leading to land use change, and
- Forest degradation: diminution of carbon stock per hectare which does not result in a reduction / destruction of forest cover.

32. It was noted that, in the context of emission reduction from deforestation, definitions of forest and deforestation, baseline, and monitoring are critical and have technical, social and economic implications in their implementation; existing forestry related definitions vary among countries and among purposes under international regimes (Indonesia).

33. A large number of other Parties highlighted the importance of definitions that enable participation of all Parties and the use of a broad type of activities, as well as the need for taking into consideration national circumstances. In this regard, Parties noted that:

• Definitions should allow the participation of all Parties and the use of different types of activities for reducing GHG emissions from deforestation (Chile; Gabon on behalf of seven countries of the Congo Basin; Peru on behalf of eight countries of Latin America)
• Definitions applied to reducing emission from deforestation and forest degradation should enable all Parties' participation and the inclusion of broad array of activities (Indonesia)
• Parties should use the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, where appropriate, while also seeking increase participation of Parties in reducing GHG emissions through a review of definitions that could support a broader range of activities affecting deforestation, selective logging and forest degradation (Bolivia, Costa Rica, Nicaragua and Papua New Guinea)
• Definitions of forest, deforestation, avoided deforestation, and baseline should take into consideration, and be based on, the diversity of national circumstances and priorities (Panama on behalf of six countries of Central America)
• In establishing what is meant by "deforestation", consideration must be given to consideration of the issues of temporary and permanent forest cover change, land use change, harvest activities, and legal and illegal activities, and should also include establishing the scale and significance of the various activities across countries (Australia)
• For defining forest cover, devegetation of non forest areas should be taken into account in a broad analysis of definitions, considering that changes in some non forest vegetation types might cause considerable emissions (Bolivia)
• The opportunity of using definitions based on biomes should be considered (Gabon on behalf of seven countries of the Congo Basin)
• Deforestation is generally defined as the transition from any forest type to any non-forest type (which involves a land-use change) while forest degradation is used to describe the transition from closed forest to open or fragmented forests (no land-use change). (Malaysia)

3. Monitoring, measuring, estimation and reporting, and data issues

34. The need for monitoring and the ability to quantify uptake and emissions from tropical deforestation, including the availability of methodologies and tools and high quality data on forest cover and changes, has been identified by most Parties that expressed views on methodological issues. While some Parties provided general information on current methods, approaches and challenges related to monitoring and the quantification of emissions, other Parties provide examples based on national experience. Satellite monitoring, forest inventories, biomass measurements, ground data, use of IPCC methods are among the approaches referred to by Parties as outlined below.

35. As was noted by a number Parties, remote sensing is an important tool for monitoring changes in land and forest cover (e.g. Bolivia, Costa Rica, Nicaragua and Papua New Guinea; EC and its Member

States; Morocco) and can be refined to include detection of forest degradation at various levels (Bolivia, Costa Rica, Nicaragua and Papua New Guinea). Indonesia referred to the use of satellite imageries as integral part in determining forest cover both at baseline and after project conditions.

36. According to the experiences by Bolivia who monitors large scale deforestation on an annual basis, methods in remote sensing, forest inventories and biomass allow to accurately measure changes in carbon stocks and monitor the impacts of different types of the forest degradation and deforestation at the national level with an appropriate resolution. The full text of Bolivia's experience with regard to quantifying and monitoring is available in annex II under country experience from Bolivia.

37. Norway and Switzerland pointed to the need of complementing remote sensing data with ground data and the analysis of local samples, in cooperation with, for example local/regional experts or the private sector/land owners involved in timber activities. Similarly, the EC and its Member States noted that remote sensing for area identification is a technique covered by the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, and anticipated that a combination of ground-based techniques and remote sensing may be needed.

38. At the same time, there is tradeoff between area coverage, degree of temporal and spatial resolutions with the costs, as noted by Bolivia, Costa Rica, Nicaragua and Papua New Guinea, as well as Indonesia, who emphasized that Parties must balance accuracy considerations against cost implications to ensure that adopted definitional standards can be addressed at sufficient scale.

39. In addition to remote sensing, econometric models can be used to quantify international leakage, if any, and socioeconomic impact assessments should be included to track the effects of established national incentive schemes (Bolivia, Costa Rica, Nicaragua and Papua New Guinea).

40. Some Parties identified issues for further exploration in the context of methodological approaches in relation to estimation methods and monitoring, as follows:

(a) The EC and its Member States noted that some aspects of monitoring may still require development and refinement, such as detection of forest losses short of deforestation and estimation of forest biomass.

(b) In the context of ensuring practicability to reduce and reverse the loss of forests, Japan identified the need to fully assess technical applicability, including limitation of efficient remote sensing technology and data availability on forest resources, as well as to consider the question of whether satellite is the only technology to monitor and how double counting could be avoided.

(c) According to Indonesia, methodological approaches to be identified could include the estimation of emission rate caused by deforestation (land use change) and forest degradation (change in carbon stock) based on historical data and national circumstances, and methodology to asses the lost of carbon pools caused by deforestation and forest degradation using Good Practice Guidance and IPCC inventories.

(d) With regard to approaches and monitoring the rates of forest cover change and land use change and GHG emissions over time, Australia noted the following issues for exploration:

- Cataloguing the methods and approaches including the technological tools and techniques that are available to monitor forest cover change
- Consideration of how data on forest cover change can be incorporated in a GHG inventory
- Consideration of methods to establish certainty in emissions estimation standards and accounting compliance (e.g. wall to wall and comprehensive accounting; Tier 3 spatially explicit accounting; assessment at a national and/or regional scale.

41. A number of Parties expressed views on possible criteria that a monitoring system should fulfil (e.g. with regard to standards or frequency), as well as on reporting and the use of methods:

Monitoring

• The monitoring process must use the highest standards of reliability and transparency (Panama on behalf of six countries of Central America)
• Monitoring system should be robust and cost-effective (Indonesia)
• Monitoring deforestation should be undertaken every five years (Panama on behalf of six countries of Central America)

Estimation methods and reporting

• The IPCC guidelines for GHG inventories provide assistance and methods for estimating, measuring and reporting GHG emissions and removals by sinks. Changes in carbon stocks and anthropogenic GHG emissions in relation to deforestation in developing countries should be assessed using comparable methods to IPCC Guidelines, Good Practice Guidance and any further methodologies provided by the IPCC. (EC and its Member States)
• Emissions related to deforestation and uptake from regeneration should be reported in Parties' national inventories using IPCC good practice methods; accurate, transparent national inventories based on agreed methods offer the best hope of assessing whether policies and actions taken to reduce deforestation actually translate into reductions in GHG emissions. (United States)
• Parties should be able to choose their own methodology, but methodologies would need to be approved by an International Accredited Certification Body or any such qualified entities (FAO, OIMT, IPCC, etc.). The Revised 1996 IPCC Guidelines and the Good Practice Guidance for LULUCF could serve as the basis to develop appropriate methodologies. (Panama on behalf of six countries of Central America)

Issues relating to accounting

42. Bolivia noted that a full carbon accounting approach would allow for a comprehensive accounting of all stock changes on terrestrial surfaces, and suggests consideration of the following activities under a comprehensive accounting system of avoided LULUCF emissions: deforestation; selective logging; shifting and shifted cultivation; fires; other types of intervention (roads, settlements, clearing, fragmentation).

43. The view of the United States is that the best way to track the effectiveness of climate change response strategies is through comprehensive accounting of all GHG sources and sinks.

44. Japan noted the need for discussing the question of how to keep accounting consistency when forests had reversed from sources to sinks/reservoirs.

Limitations, needs, information sharing and capacity building

45. In light of the technical and methodological challenges related to monitoring and the estimation of carbon stock changes and related GHG emissions, many Parties expressed a need for sharing experiences and for capacity building as outlined below.

46. Many Parties noted the lack of financial and human resources in many countries to carry out monitoring, and the need of making available resources for technical training, logistical support, technology transfer and monitoring (Panama on behalf of six countries of Central America). As mentioned by Norway, many developing countries do not presently have the equipment or technology to produce reliable estimates of land-use changes on their own land. Given the need for local expertise (i.e. to analyze ground data) relatively large resources and substantial capacity building would be necessary to establish satisfactory monitoring in a baselines and crediting scenario and achieve sufficiently precise estimates of deforestation. Improved monitoring and managing capacity is crucial to any strategy to reduce deforestation in developing countries and related emissions. One approach for addressing deforestation emissions under the UNFCCC would therefore be to give priority to capacity building and technology transfer.

47. Also Indonesia noted the importance of capacity building and technology transfer to improve deforestation monitoring capacity, taking also into account that certainty in emission reduction from deforestation would require a credible reporting in the national communication.

48. The EC and its Member States also highlighted the need for addressing capabilities and cost effective approaches of monitoring and reporting emissions from deforestation. Sharing experiences and efforts among countries and further development of national and regional technical capabilities will play an important role.

49. Switzerland suggests the establishment of a list of reliable data sources on deforestation and land-use change in the forest sector, as well as methodologies and tools for quantification and monitoring. Experiences in quantification of emissions reductions (including the consideration of baselines, permanence and leakages) should also be systematized. Similarly, Australia considered a key issue for exploration the conduction of a stocktake of existing efforts to monitor and address forest cover change in developing countries, including for reasons other than climate change (e.g. biodiversity).

4. Baselines, additionality, leakage and permanence

50. Many Parties addressed issues like baselines, additionality, leakage and permanence in the context of other topics such as monitoring or general methodological considerations. The following paragraphs cover information from only those Parties that provided views specifically on any of those issues.

Baselines/ reference scenarios

51. The challenges and expected difficulties of establishing appropriate baselines and reference scenarios was discussed by many Parties. For example, Norway described existing challenges with establishing baselines as follows:

> "Establishing baselines for emissions and related activities is always challenging due to uncertainty about the future. Establishing deforestation emissions baseline rates at country level may be particularly difficult. Major challenges include shortcomings of knowledge about past trends, problems of estimating carbon loss as a consequence of different kinds of disturbance, and the regional variations of deforestation dynamics. Recent estimates of deforestation at global, national and regional levels have large uncertainty ranges, a problem which may also make it difficult to obtain the historical deforestation data needed for establishing a baseline. Historical baselines for forest cover and historical deforestation rates are issues of contention in many regions and the focus of much recent scholarly work. Variations in biomass of different forest types also contribute to the uncertainty in the estimates. Tropical forests vary between open dryland forests to dense tropical rainforests, and different forest varieties contain widely different amounts of carbon in the stem, branches and root systems. Moreover, there are uncertainties related to the distribution of various forest types across regions. There may also be patchworks of various forest types, where average "carbon content" may prove difficult to estimate within tolerable limits of uncertainty."

52. Most Parties also provided views on general criteria or principles that should be taken into account when considering baselines and methods for establishing them, e.g. fairness, ensuring environmental integrity of existing processes, and the need to take into account national circumstances. Views on aspects to consider when establishing baselines are summarized below:

• Reference scenarios/ baselines for GHG emissions from deforestation should take into account historical trends and other circumstances (national and regional) at the appropriate scale and should not disadvantage countries that have taken early actions. (Chile; Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Gabon on behalf of seven countries of the Congo Basin; Panama on behalf of six countries of Central America; Peru on behalf of eight countries of Latin America)
• Baselines should be assessed in a fair way, take account of different situations in order to achieve broad participation, and should be defined in a way to promote activities additional to business-as-usual, while not penalizing early action. • Inter-annual variability should be taken into account. (EC and its Member States)
• Baselines should be negotiated for each country according to existing information availability and criteria for national policies. The baseline should include a monitoring plan to be executed. Avoided deforestation should be calculated upon the basis of non-deforested surface considering the agreed monitoring plan. • To respect fairness, methods must ensure that countries with traditionally low deforestation rates are not disadvantaged and that countries with historical high rate of deforestation are not rewarded. A possible mechanism to ensure fairness is to use the global deforestation baseline for the developing world as a reference. • Methodologies used must guarantee the environmental integrity of the UNFCCC and the Kyoto Protocol. (Panama on behalf of six countries of Central America)

• Robust projections of avoided deforestation, degradation, and devegetation require agreed definitions on historical baseline periods, projection methods, and validation procedures; • Each Party could propose country specific baseline periods, taking into account forest cover, deforestation rates and economic development. • Areas of interventions have to be related to corresponding biomass values depending on vegetation types (IPCC GPG for LULUCF; LULUCF modelling) (Bolivia; see also annex II Country experiences where the full text of key elements of a baseline approach as submitted by Bolivia is provided)
• Methodologies to address GHG emissions from degradation should be based on areas under approved management plan and/or certification, compared to a reference scenario (Gabon on behalf of seven countries of the Congo Basin)
• One approach to consider would be the establishment of baseline deforestation rates based on national forest inventory data. (Morocco)
• Questions to solve in baseline determination include questions of the *boundary* and base year to be used • As regards identification of methodological approaches the following is suggested: o "Exercise on using national or regional baseline with methodology already approved or reported internationally. Increasing deforestation avoidance to the level above baseline rate or reducing deforestation to below baseline rate. The result, however, will depend on the quality and accuracy of the data used. For this reason, approaches to determine baselines should accommodate national circumstances and need to be negotiated at the proper time." o Modelling approach (e.g. GEOMOD) with precautionary measures especially when is applied in local scale caused by the difficulty in dealing with leakage. On the other hand it is not easy to be applied at the regional level." (Indonesia)
• Malaysia noted concerns with respect to creating perverse to countries to increase their timber harvests in the remaining years so as to have a more favourable baseline)

53. Specifically on leakage, additionality and permanence, the following views were expressed:

Leakage

• Leakage is an important issue for successful climate-change mitigation policy formulation. The formulation of national policies aiming at reducing deforestation within national boundaries is a promising way towards reducing negative leakages. • On a national level, verifying negative leakage as a consequence of e.g. forest protection would require an area-wide effective monitoring system. • On an international level, leakage from one country to another can be reduced by including all relevant Parties, especially those with high forest cover in an international reduction regime. (EC and its Member States)
• A 'national approach' to monitoring deforestation is critical to addressing leakage issues and will require an effective area-wide monitoring system. Issues related to concerns for 'international leakage' must be applied fairly across sectors and among Parties. (Bolivia, Costa Rica, Nicaragua and Papua New Guinea)
• A technical issue for discussion concerning leakage is the question of the possibility of establishing national level baselines. (Japan)

- Different aspects relating to leakage should be treated separately, distinguishing between the special domain, the intra-sectoral domain and the cross-sectoral domain;
- Leakage can be estimated with state of the art remote sensing technology and econometric modelling approaches.
- The current definition of leakage concerning LULUCF relates to project based approaches, hence, a more comprehensive and operational definition should be agreed considering different sectoral and spatial domains.
- A closer look at the issue of international leakage in general should be taken, and recent econometric modelling approaches, in particular.
- Scientific exchange on these issues should be encouraged.

(Bolivia; see also annex II Country experiences where the full text concerning leakage as submitted by Bolivia is provided)

Permanence

- A future framework should consider that reductions in deforestation are potentially reversible, therefore it should provide for long term action, and sustained management and conservation of forests. Furthermore the implication of natural events (i.e. natural fires, storms, flooding, etc.) on carbon stocks needs to be considered.

(EC and its Member States)

- Permanence issues can be addressed using a variety of instruments, including temporary credits, a 'banking' mechanism or incorporating commercial insurance services to address natural events, such as fires, storms, flooding, etc.

(Bolivia, Costa Rica, Nicaragua and Papua New Guinea)

- Different approaches are discussed to tackle the challenge that avoided LULUCF emissions show higher permanence risks. If Parties identify certain areas, where emissions are avoided and appropriate leakage monitoring is operational, changes in vegetation cover can be monitored. Banking carbon credits as a risk buffer for future commitment periods could be appropriate, too, depending whether a Party will choose either binding or nor-regret targets.

(Bolivia)

- A technical issue for discussion concerning permanence is the question of how to consider the length of commitment period and continuity to the third commitment period.

(Japan)

Additionality

- Given the constant increase of deforestation on a global scale, national reductions of deforestation rates under an extended climate regime could be viewed as per se additional.
- Efforts to reduce deforestation beyond UNFCCC will continue. ODA should have a complementary role in conserving global forests.
- Additionality can be ensured by comprehensive reporting schemes, which should document the efforts of the Parties in reducing deforestation, the origin of its finance, and the use of incentives stimulated under the UNFCCC.

(Bolivia; see also annex II Country experiences where the full text concerning additionality as submitted by Bolivia is provided)

- Technical issues for discussion concerning additionality are the questions of whether it is possible to establish appropriate baseline and whether the rate of deforestation works to reverse the loss of forests.

(Japan)

III. Policy approaches and positive incentives for reducing emissions from deforestation in developing countries

A. Overview

54. In following the mandate of the COP, Parties provided views on policy approaches and positive incentives for reducing emissions from deforestation as well as exchanged relevant information and experiences. This section provides a synthesis of these views.

55. This section also focuses on policy approaches and positive incentives covered in the workshop's background paper on "Policy approaches and positive incentives"(part II, working paper no. 1 (b) (2006)), including bilateral and multilateral cooperation; activities of other relevant international bodies; enhancing sustainable forest management; capacity building; and financial mechanism and other alternatives, as addressed in submissions by Parties. The other topics on causes; short- and long-term effectiveness with respect to emissions reductions; and the displacement of emissions are discussed in section II of this synthesis.

56. Due to the inter-linkages of some of the above listed items, including linkages to scientific, socio-economic, technical and methodological issues and the grouping of issues used by Parties in their submissions, the structure of the present section may not in all instances follow the above list of items. In addition, for practical reasons, terminology and topics included in this part of the synthesis generally correspond to that used by Parties in their submissions. Coverage and level of detail on the above items vary depending on the information provided in the submissions.

B. Policy approaches

57. A variety of policy approaches were identified by Parties in their submissions as necessary to address the issue on reducing emissions from deforestation in developing countries.

1. Relation to sustainable development

58. Many noted that due to the varying national and regional circumstances, a range of approaches will have to be considered in addressing the issue and the choice of approaches will have to take into account national circumstances. Some of these Parties also linked discussion of the issue to sustainable development and/or sustainable forest/ land management. These Parties include Bolivia, Costa Rica, Nicaragua, and Papua New Guinea,[10] Brazil; Chile; the European Community and its member States,[11] Gabon on behalf of seven countries of the Congo Basin,[12] Indonesia; Japan; Malaysia; Norway; Panama on behalf of six countries of Central America,[13] Peru on behalf of eight countries of Latin America,[14] Switzerland; and United States of America. Brazil, Japan, Malaysia and Norway related the conservation and sustainable management of forests to the context of Article 4, paragraph 1(d) of the UNFCCC.

59. Box 1 summarizes some examples of views by Parties linking the discussion of the issue to sustainable development.

Box 1: Some examples of views of Parties relating the issue to sustainable development

Sustainable management of forest, reducing the impact on the biomass but at the same time use the

[10] The joint submission by these four Parties is supported by Central African Republic, Dominican Republic and Solomon Islands.
[11] This submission is supported by Bulgaria, Romania, Croatia, Albania, Bosnia and Herzegovina, Serbia and Montenegro, former Yugoslav Republic of Macedonia and Turkey.
[12] Cameroon, Central African Republic, Chad, Congo, Democratic of the Congo, Equatorial Guinea and Gabon.
[13] Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama
[14] Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama, Peru, Uruguay with the support of Bolivia

natural resource for income generation and sustainable economic growth should be taken into consideration. (Bolivia)
The EU believes that any effective approach should . . . support the development of national and international policies of sustainable land management; foster the sustainable use of forest ecosystems and the conservation of forest biological diversity and take account of non-carbon forest values; . . . encourage long-term action and sustained management and protection of carbon stocks, while avoiding the creation of perverse incentives. . . . Identification of incentives should be based on the contribution to long-term sustainable land and forest management, while reducing pressures towards unsustainable land use or land-use changes. . . . (European Community and its member States)
Parties have the sovereign right to define sustainable development and resource utilization pursuant to national priorities in order to fulfil their present needs without limiting the options for future generations. . . . (Bolivia, Costa Rica, Nicaragua, and Papua New Guinea; Gabon on behalf of seven countries of the Congo Basin; Chile; Panama on behalf of six countries of Central America; Peru on behalf of eight countries of Latin America)
In addition to the potential GHG benefits, reducing deforestation provides a variety of other important environmental, economic and social benefits. . . . The conservation and sustainable management of forests can help ensure the diverse benefits are available to future generations (United States of America)

2. Legal and institutional instruments

60. According to the European Community and its member States, “appropriate strategies to reduce emissions from deforestation will largely depend on social, economic and regulatory factors at both national and international levels. Therefore, a range of instruments has to be considered to enable these strategies and measures to be tailored to specific regions, countries and localities”.

61. Several Parties shared experiences of national legal and institutional frameworks in enforcing and ensuring the sustainable use of forests as well as in reducing/ avoiding deforestation (Box 2).

Box 2: National experiences on legal and institutional frameworks

Despite the fact that, in accordance with the principle of common but differentiated responsibilities of countries, the Government of **Brazil** does not have commitments to reduce or limit its anthropogenic emissions of greenhouse gases, there are many programs in Brazil that result in a considerable reduction of greenhouse gas emissions. Several other initiatives that are being implemented, in particular to reduce the annual rate of gross deforestation, as well as to promote sustainable forestry management, have also contributed to changing the curve of greenhouse gas emissions in Brazil.
The establishment of the National System of Protected Areas (SINAC) under the Ministry of Environment and Energy (MINAE) in 1995, resulted in a unified but decentralized system for managing protected areas and coordinating conservation activities on a regional and local basis. The expansion and strengthening of the country's protected area system has been important in arresting the loss of forest. . . . In 1996, **Costa Rica** adopted a new Forestry Law (No. 7575), which explicitly permits landholders to be compensated for providing environmental services (carbon emissions reductions, biodiversity, watershed protection, ecotourism and scenic values) to the society.
Malaysia remains committed to manage her forests sustainably. Forest management objectives are clearly specified in the National Forestry Policy. . . . Malaysia's 'best practices' approach to forest management has been able to conserve the biological resources and carbon stocks by avoiding the deforestation cycle. . . . Malaysian forests under the Permanent Reserved Forests (PRFs) do not undergo a change in land use. This is illustrated by the fact that the area of Malaysian forest under the PRFs has not changed substantially in the last 10 years.
Act on protection of the BaekDu Mountain System(BDMS, the longest series of mountain ranges in Korean Peninsula) was established to expand designation of protected areas. And the objective and reasonable criteria were set to prevent forests from unreasonable deforestation under this Act. Also, to prevent occurring careless land exploitation, Forest Land Management Act aims to impose penalty on those who want to utilize forests for other purpose and these funds shall be used for forest projects such as afforestation and forest tending. (**Republic of Korea**)

62. In addition to the experiences of Parties noted above, Bolivia, Costa Rica, Nicaragua and Papua New Guinea also elaborated their country's legal frameworks for regulating the sustainable use and protection of forests. The detailed experiences of these countries are presented in annex II, as part of sharing of experiences.

63. Panama on behalf of six countries of Central America shared the experience of their regional approach to fight environmental degradation and to implement more sustainable land use.

> "The Central American Forestry Strategy (EFCA) was approved during the XXXIV Ministerial Meeting of the Central American Commission on the Environment and Development (CCAD), of October, 2002. The EFCA hopes to curb the deforestation process in the region by having all Central American countries reviewing or updating their forest policies and National Forest Development Programs. . . . The goals of EFCA are: (i) Strengthen the forest agenda in Central America; (ii) Increase forest coverage in the region; (iii) Restore degraded forests; (iv) Strengthen the Central American System of Protected Areas (CAPAS); and (v) Promote the competitiveness of the Central American forest sector. . . . Within this context, the Ministerial Council of the CCAD has approved three regional programs framed within the initiative of the Mesoamerican Biological Corridor. . . . "

64. Many Parties were also of the view that policy instruments for address reducing emissions from deforestation "must involve all "actors" in an equitable way taking into full account the legitimate needs of developing countries to achieve sustained economic growth and eradicate poverty." They also suggested that in order to strengthen actions to reduce greenhouse gas emissions from deforestation, national institutions will possibly need to ensure "the implementation, monitoring and enforcement of existing and/or new measures to control deforestation," and modify "existing legislation to remove institutional/legal incentives to deforest." These Parties include: Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; and Peru on behalf of eight countries of Latin America. Morocco in her submission also noted that the building of government policies on sustainable management of forest resources should be on the basis of a participative and partnership approach with all actors concerned.

3. Sustainable forest management

65. In addition to views on sustainable development and legal or institutional frameworks for supporting sustainable management of forests and forest resources, a number of Parties also elaborated views and/or provided experiences on enhancing sustainable forest management. The detailed experiences of Bolivia, Malaysia, Nicaragua and Papua New Guinea on sustainable forest management are presented in annex II.

66. At least three Parties provided specific views on enhancing sustainable forest management as part of addressing the issue of deforestation. Japan is of the view that

> ". . . current decisions under UNFCCC and its Kyoto Protocol have not fully evaluated the implications for policies and measures towards sustainable forest management . . . . In this regard, the coming discussion should focus on how efforts for sustainable forest management be assessed and accounted under UNFCCC, which needs to take into account harmonization and consistency with discussions on sustainable forest management under relevant international organizations and forums, *inter alia* UNFF. . . . Japan recognizes the importance to reduce and further reverse the loss of worldwide forest coverage through sustainable forest management, including protection, restoration, afforestation and reforestation, and increase efforts to prevent forest degradation."

67. Switzerland noted her involvement in a number of processes at different levels (ITTC, CBD, FLEG and UNFF) aimed at promoting sustainable forest management as part of promoting sustainable development. In line with national circumstances and these other international processes, Switzerland added that:

> "Further actions may envisage defining voluntary objectives by countries and forests owners that once achieved would allow access to market-based mechanisms for the protection of the global climate. . . . We consider that these actions have to take into account the causes of deforestation (social, institutional and economic drivers). They should identify criteria and indicators for defining where deforestation can be reduced first and with durable effect and which may be useful technical measures that may help reducing deforestation and promoting sustainable forest management. Finally, an important element that should be taken into account in this context is the certification of forest management."

68. The United States of America in her sustained commitment to helping tropical countries conserve and protect their forest resources identified actions to reduce deforestation. Some of these actions could include increased financing for sustainable forest management and protection; and strengthening forest institutions to implement and enforce forest management and protection policies and plans. They provided their experiences in developing countries through the implementation of the Tropical Forest Conservation Act (TFCA). Experiences on the implementation of the TCFA can be found in annex II.

69. Conservation and protected areas. In addition to the sustainable management of forests, Parties also proposed that approaches could include enhancement of conservation activities inside and outside

protected areas. Parties sharing this view are Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; Panama on behalf of six countries of Central America; and Peru on behalf of eight countries of Latin America. Several Parties also provided further information on their national park systems and protected areas. These Parties are Costa Rica; Malaysia; Panama on behalf of six countries of Central America; and Papua New Guinea. The United States of America related their forest protection programmes under the U.S. Agency for International Development (USAID), in particular, *Parks in Peril* (PiP). Since 1990, this programme has worked to improve the protection of forty-five critically threatened national parks and reserves in Latin America and the Caribbean.

4. Integration with other land use activities

70. Many Parties also proposed that in policy approaches related to sustainable land use, there is a need to design and implement sustainable and efficient activities on non-forested land (used for agriculture, ranching etc.,) to reduce pressure on forests. Parties sharing this view include Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; and Peru on behalf of eight countries of Latin America.

71. Panama on behalf of six countries of Central America noted the challenge facing Central America which is "to develop sustainable economic activities that will maintain natural forests dynamics, carbon stocks while maximizing social benefits. For example, activities such as ecotourism, sustainable forestry and extraction of non-timber forest products are all compatible with the idea of reducing emissions from tropical deforestation."

5. Linkages with other environmental issues and synergies with other global processes

72. Some Parties also shared the view that there need to be synergies between the UNFCCC process and other international processes in addressing this issue of reducing emissions from deforestation in developing countries. Among the international processes/ organizations in which synergies could be promoted include Convention on Biological Diversity (CBD); the Collaborative Partnership on Forests (CPF); Forest Law Enforcement and Governance Initiatives (FLEG); Global Environment Facility (GEF); the International Tropical Timber Agreement (ITTA) under the International Tropical Timber Organizations (ITTO); Center for International Forestry (CIFOR); Food and Agriculture Organization of the United Nations (FAO); United Nations Forum on Forests (UNFF); and United Nations Convention to Combat Desertification (UNCCD).

73. Parties that expressed this view include: the European Community and its member States; Indonesia; Japan; Norway; Panama on behalf of six countries of Central America; and Switzerland.

74. According to Panama on behalf of six countries of Central America, it is important to take into account the inter-linkages between mitigation, adaptation and deforestation avoidance. Activities that reduce emissions from deforestation could facilitate synergies and integrate actions that also contribute to biodiversity conservation, combating drought and desertification, wetlands conservation, adaptation to climate change and enhancing carbon storage. The protection of existing tropical forests will also help to achieve the goals of the UN Convention on Biological Diversity.

75. This group of Central American countries provided the case of the Mesoamerican Biological Corridor as an example of synergy. This initiative provides "a cooperation framework linking the Conventions on Climate Change, Fight Against Desertification and Drought, Biological Diversity and Wetland Protection, as well as regional initiatives such as the Alliance for Sustainable Development, the Central American System of Protected Areas, and the Central American Forest Strategy".

C. Positive incentives

76. Parties also provided views on a variety of financial-based positives incentives that could be considered in addressing the issue on reducing emissions from deforestation in developing countries. As with policy approaches, Parties noted that a flexible range of positive incentives should be considered and many of the proposals are also closely tied to issues on process within the UNFCCC.

77. In addition, the joint submission of Bolivia, Costa Rica, Nicaragua and Papua New Guinea noted that all options on positive incentives should be on a voluntary basis and should not be "mutually exclusive".

1. New and supplemental financial resources

78. Many Parties stressed the need for new and supplemental financial resources to address the issue of reducing emissions from deforestation, without affecting the current financial resources planned for other programmes and sectors under the UNFCCC process. The Parties calling for supplementary funding on this issue include Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Brazil; Chile; Gabon on behalf of seven countries of the Congo Basin; Panama on behalf of six countries of Central America; and Peru on behalf of eight countries of Latin America. Almost all these Parties proposed that supplementary funding be one of the guiding principles in the discussion of the issue.

79. At least two Annex I Parties noted the need to create financial resources for stimulating actions to reduce emissions from deforestation in developing countries. New Zealand, in her submission, expressed their willingness to explore the range of possible avenues for creating a revenue stream from standing forests. They remain open-minded on the appropriate institutional vehicle to deliver this revenue stream. Norway also mentioned the possibility of establishing a fund for forest conservation projects, capacity building and technology transfer and combinations of these as one of the ways of creating incentives.

2. Official development assistance (ODA) approach

80. For many of the Non-Annex I Parties, the ability to initiate any action to address the issue would depend on adequate resources available up-front. Relating this view to within the context of Article 4, paragraphs 3, 4 and 7 of the UNFCCC, they proposed that Parties could coordinate ODA at a scale sufficient to meaningfully reduce emissions from deforestation in developing countries. Parties sharing this view include Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Costa Rica; Gabon on behalf of seven countries of the Congo Basin; and Peru on behalf of eight countries of Latin America. Among the forms of up-front financing identified by these Parties are debt-for-nature swaps, revolving funds, advanced payments and new donor programmes.

81. The United States of America provides debt relief or debt swap through bilateral agreements under the TFCA as well as funding to combat illegal logging and fighting corruption in the forest sector under the President's Initiative against illegal logging. Details on these ODA approaches supported by the United States of America can be found in annex II.

3. Market-based approaches

82. Market-based approaches were also proposed by Parties as among the options to stimulate actions to reduce emissions from deforestation in developing countries. Parties indicating support for market-based approaches include: Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; Indonesia; Panama on behalf of six countries of Central America; Peru on behalf of eight countries of Latin America and Switzerland. In general, three main approaches, sectoral Clean Development Mechanism (CDM) approach, emissions trading agreements, and payment for environmental services, could be identified from the submissions by some of these Parties.

Sectoral CDM approach

83. Various views were provided by Parties in relation to considering activities on reducing emissions from deforestation under the CDM. In their joint submission, Bolivia, Costa Rica, Nicaragua and Papua New Guinea proposed the sectoral-based CDM approach. According to these Parties, the "basic methodological architecture is in place to incorporate this approach and only minimal adjustment is required. They went on to describe how certain technical difficulties could be addressed by such an approach:

> ". . . To address 'project-based' leakage concerns, a national baseline method would need to be instituted across the forestry sector. When 'national baselines' are considered within the CDM, however, the mechanism begins to encroach upon the 'cap and trade' methodologies used for Annex-B Parties. Therefore, the Parties would be required to rectify the pricing anomalies and comparative risk profiles carried by a CER (increased regulatory, additionality and project risk) versus a national baseline-driven AAU/EUA-type credit."

84. However, several other Parties expressed either caution over or not in favour of the consideration of the issue under the present framework of the CDM. Box 3 presents these views by the Parties.

Box 3: Views by Parties on considering reducing emissions from deforestation under the CDM

The consideration of issues relating to reducing emissions from deforestation in developing countries is based on the assumption that these issues are going to be further considered solely under the Framework Convention on Climate Change. The Government of Brazil does not envisage any mechanism related to reducing emissions from deforestation in developing countries that could be used by Annex I countries to meet their quantified greenhouse gas emission limitation and reduction commitments under the Kyoto Protocol. (Brazil)
. . . However, the EU would like to underline that the relevant decisions (e.g. Marrakesh Accords, decisions in the context of afforestation and reforestation under the CDM) should not be reopened. (European Community and its member States)
Japan believes that consistency with the policy measures under the Kyoto Protocol, such as Clean Development Mechanism (CDM), should be discussed under this item. One of the major issues to be examined here is the relationship between the idea of "reducing emissions from deforestation" and that of "afforestation and reforestation CDM". For example, it potentially includes the risk of double counting because afforestation and reforestation activity contributes to increase carbon sequestration while it also contributes to reduce emission at the same time. (Japan)
Malaysia is concerned that countries that are anticipating the passage of this mechanism will have a perverse incentive to increase their timber harvests in the remaining years prior to the onset of the first commitment period in 2008 so as to have a more favourable baseline from which to calculate emissions credits thereafter. (Malaysia)

Norway prefers not to reopen the discussion of including avoided deforestation as project activities under the CDM for the first commitment period. It is possible to discuss the issue again during the deliberations under Article 3.9 of the Kyoto Protocol on the second commitment period. Whether avoided deforestation should be reconsidered as a possible CDM option will in our view depend e.g. on the availability of new information indicating reductions in uncertainty concerning additionality, baselines, leakage and permanence in relation to forest conservation projects. (Norway)
The United States reiterates its view that to the extent that such discussions involve crediting mechanisms they should occur under the auspices of the Kyoto Protocol. (United States of America)

Bilateral or multilateral emissions trading agreements

85. Bolivia, Costa Rica, Nicaragua and Papua New Guinea, in their joint submission, proposed the option of bilateral or multilateral emissions trading agreements. They added under this option:

> "Some Parties may support the development of independent bilateral or multilateral agreements to reduce emissions from deforestation in developing nations. A variety of regional and national emissions reductions markets are currently in place, or under development, that could be leveraged by Parties to reduce emissions from deforestation in developing countries."

Payment for environmental services

86. Many Parties were of the view that payment for environmental services could provide the needed incentives to manage forests on a sustainable basis. Parties sharing this view include Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; Indonesia; Panama on behalf of six countries of Central America; Peru on behalf of eight countries of Latin America and Switzerland.

87. At least two Parties provided more specific views on this approach on payment for environmental services. Switzerland stated that its position is to promote the attribution of proper value to forest goods and services, at the local, national, regional and global level. Switzerland added that they are ready to discuss the attribution of proper value to environmental services.

88. Indonesia expressed the view that compensation or incentives are needed to encourage developing countries to reduce emissions from deforestation beyond their national capacity. Any mechanism developed should be kept simple and integrated in the existing or future climate regimes (either in the framework of the Convention or the Protocol beyond 2012). They provided a few lessons learned from projects on payment for environmental services, that is, conditions necessary for this incentive mechanism to work:

> "(1) there is economic value of the services that is marketable; (2) there exists seller and buyer of the services; (3) there is negotiation process to reach agreement to give incentive in the form of environmental services payment; and (4) consensus to carry out monitoring."

89. Costa Rica and Nicaragua also provided their experiences on how schemes on payment for environmental services contribute to protection of forests and sustainable management of forest resources. More details on their experiences are given in annex II.

4. Other proposed approaches

Credit for early action

90. In the joint submission of Bolivia, Costa Rica, Nicaragua and Papua New Guinea, these Parties called for the development of policies and incentives that encourage and support bold early action by Parties that might later affect baseline formulation and consequently. result in fewer tradable emissions credits in the future. Early action should be eligible for the issuance of credits in future commitment periods. However, they noted that mechanisms for rewarding past deforestation activities should be avoided. This group of Parties provided an example that credit for early action should be considered for "expanding or consolidating networks of 'protected areas,' reduced impact forestry, and efforts to rehabilitate areas of degraded forest."

91. Costa Rica went on to specify that:

> "Within this context, Non Annex Parties that voluntarily elect or have early elected as a national policy to reduce their emissions from deforestation, on a project by project basis, during the six years previous to the end of the first commitment period of the Kyoto Protocol, would be financially compensated by Annex I Parties on the basis of their performance, taking into account an average representative annual deforestation rate over some agreed period in the past, measured with satellite imagery techniques, as a baseline."

92. Due to her "best practices" approach, Malaysia expressed concern that additionality criteria often do not favour countries like Malaysia that have already set aside large tracts of natural tropical forests for protection and sustainable management.

Annex C: The National Approach

93. Bolivia, Costa Rica, Nicaragua and Papua New Guinea further proposed in their joint submission a "voluntary Annex C" approach, specifically designed to address deforestation in which developing countries could consider participating. They continue to describe the approach:

> "In exchange for an AAU/EUA-type emissions allowance, this approach would incorporate voluntary 'national targets' for emissions reduction, utilizing a 'cap and trade' methodology similar in structure to that applied for Annex-B Parties. However, it must be noted, that by using a national baseline approach to overcome the project-based leakage issues and project performance risk, there would be minimal transactional or performance risk issues remaining that currently justify CER-type valuation discounts. Therefore, the emissions credits issued under the 'National Approach' should be fully fungible with AAU/EUA emissions allowances. Credit should be considered for action in advance of the 'Second Commitment Period'."

94. However, Brazil provided the view that efforts undertaken by developing countries to reduce emissions from deforestation in their territories can only be characterized as voluntary and, therefore, cannot be linked or associated to goals, targets and timeframes.

Optional Protocol

95. The option of an "optional protocol" was also put forward by Bolivia, Costa Rica, Nicaragua and Papua New Guinea in their joint submission. However, these Parties acknowledged that this option would require further analysis in relation to incentive structures. It would also require more time and effort to implement than other options proposed. Furthermore, to ensure effectiveness at the scale level, a system of fungible credits (within some future commitment period) would need to be developed.

96. Norway was also of the view that one of the possible approaches to stimulate action to reducing emissions from deforestation in developing countries could be a separate protocol or new agreement. Brazil also provided a view on a possible new arrangement,

> "The Government of Brazil strongly believes that the discussion on issues relating to reducing emissions from deforestation should touch upon the convenience of establishing a new arrangement, within the Convention, to provide positive incentives to developing country Parties in this context. Such incentives should encompass the provision of new and additional financial resources and transfer of technology, as well as capacity building and enhancement of endogenous capacities, . . ."

97. Malaysia, on the other hand, provided the view of not being in favour of an optional protocol to address this issue. The Party cited that consideration of an optional protocol would be difficult and time consuming and consideration of this matter would be best done under the current protocol.

Other options

98. Recognizing the need to consider a range of options on positive incentives, other options that could also be developed were proposed by Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; and Peru on behalf of eight countries of Latin America. These proposed options include: concrete proposals to initiate a tax or fee system in Annex I countries on airline emissions, carbon-intensive commodities and services, or on the trade of military goods and related services.

99. Panama on behalf of six countries of Central America stated that they are open to discussions on financing through the participation of private agents such as Social Corporate Responsibility Programs, Payment for Environmental Services, etc. In this context, these Central American countries support the exploring of alternatives such as voluntary carbon markets as a means to stimulate action to reduce emissions from deforestation in developing countries.

5. Incorporating actions within existing funds and/or programmes under the UNFCCC process

100. Several Parties also made recommendations that the issue on reducing emissions from deforestation in developing countries be considered under existing funds and/ or programmes under the UNFCCC process.

101. El Salvador provided specific views on considering the issue of reducing emissions from deforestation within the funds and programmes of the UNFCCC process. Their views noted the following:

- Five year programme of work of the Subsidiary Body for Scientific and Technological Advice (SBSTA) on impacts, vulnerability and adaptation to climate change. The issue on reducing emissions from deforestation should be highlighted under two thematic areas of the programme, namely, (a) impacts and vulnerability; and (b) planning, measures and activities related to adaptation.

- Special Climate Change Fund. It is feasible "to promote the design and execution of projects that reduce emissions from deforestation in developing countries within the Special Climate Change Fund (SCCF), identifying and taking advantage of the appropriate sectors and thematic areas already established under the SCCF guidelines, namely: a) forestry, b) soil planning and management, c) fragile ecosystems, including mountainous systems, and d) planning and integrated management in coastal zones."

- The Adaptation Fund. Some activities relating to reducing emissions from deforestation, should be promoted and supported, namely:

    - Ecological conservation and restoration of tropical forests in degraded or marginalized soils, through natural or assisted regeneration.
    - Conservation and restoration of native forests to establish or consolidate environmental corridors, in the context of current efforts to strengthen natural protected areas systems, including riparian, estuarine and ecotonal forests.

- Conservation and restoration of forest ecosystems that contribute to biodiversity conservation, taking into account, *inter alia*: variety and density of species, endemic and endangered species, species contributing to human health, food security or that are relevant for wild life.

102. Panama on behalf of six countries of Central America also supported similar views in relation to considering the issue under existing funds and/ or programmes of the UNFCCC process. Morocco, being vulnerable to the effects of climate change, also provided a general view that the issue be considered under the Special Climate Change Fund and the Adaptation Fund.

D. Multilateral and bilateral cooperation

103. An essential element identified by nearly all Parties in their submissions that was required and important for addressing the issue of reducing emissions from deforestation in developing countries was multilateral and bilateral cooperation. Since many developing countries may not have the technical capacity nor the financial resources to adequately address the issue, multilateral and bilateral cooperation or other forms of partnerships provide positive incentives such as technology transfer and capacity building to assist developing countries on this issue.

104. Parties did not provide specific multilateral cooperation examples. Most of them expressed multilateral cooperation through the need for synergies with other forestry-related multilateral agreements/processes and institutions (refer to linkages with other environmental issues and synergies with other global processes).

105. However, in providing country experiences, two Parties included existing cases of bilateral cooperation or partnerships with non-governmental organizations in their countries. These Parties include Bolivia (project partnerships with Fundación Amigos de la Naturaleza, the Nature Conservancy and energy companies) and the United States of America (six programmes that relate to conserving forest resources and slowing deforestation in developing countries, either in the form of bilateral agreements with developing countries, partnerships with conservation organizations and/or public-private partnerships). Capacity building and technology transfer are included in these bilateral cooperation and partnership examples. They are described as part of these two countries' experiences in annex II.

106. Non-Annex I Parties emphasized that capacity building and technology transfer will be required to address the issue as well as to sustain efforts against deforestation. However, financial resources will be required for such activities. These Parties include Bolivia, Costa Rica, Nicaragua and Papua New Guinea; Chile; Gabon on behalf of seven countries of the Congo Basin; Indonesia; Morocco; Panama on behalf of six countries of Central America; and Peru on behalf of eight countries of Latin America. Examples of areas for capacity building and technology transfer include institutional strengthening for monitoring and enforcement; and for implementation of emission reduction policies in the land use sector. Brazil added that the building and enhancing of endogenous capacity should be channelled to government programmes containing measures that contribute to reducing emissions from deforestation in developing countries. Norway stated that capacity building and technology transfer should be given priority in addressing deforestation emissions under the UNFCCC as these are required in establishing satisfactory monitoring of baselines and crediting scenario.

1. Exchanging information and experiences

107. Parties also mentioned the need to exchange/ share information and national experiences on a range of technical and policy issues as part of discussing and addressing the issue. Parties that expressed this view include Australia; Bolivia, Costa Rica, Nicaragua, and Papua New Guinea; the European Community and its member States; Switzerland and the United States of America.

108. Pilot programs. Bolivia, in her submission, noted the need for pilot programmes to allow learning from on the ground experiences, support south-south technical cooperation as well as support for addressing monitoring and control challenges. Such experiences should be easily transferred to other

countries in the region to create a level playing field and ensure equity. Indonesia proposed that pilot projects for voluntary markets should be implemented as a way for developing countries to build capacity through learning by doing. However, up-front financial support is essential to initiate these activities. Switzerland proposed that the Convention may issue a recommendation to promote innovative pilot projects to allow the gaining of experience in the field.

109. Bolivia, Costa Rica, Nicaragua, and Papua New Guinea proposed collaboration on voluntary "National level pilot initiatives to inform policy development". Such voluntary initiatives could help:

> ". . . develop robust methods for base-interval development and address the opportunity costs associated with various land-use options – as has been the case with AIJ and JI projects. Countries from different regions could deliver experiences from the field to support the development of positive incentive schemes within the SBSTA/SBI process."

110. Sharing national experiences. Annex II presents information and national experiences on forest management, policies and plans as shared by several Parties.

Annex I

Recommendations on any further process

Submission by	Guiding principles	Process under the Subsidiary Bodies	Future Processes under the UNFCCC	Page reference in Misc.5 and Add.1[1]
Australia		SBSTA		page 5
Austria on behalf of the European Community and its member States[2]		SBSTA		page 9
Bolivia, Costa Rica, Nicaragua and Papua New Guinea[3]	√	SBSTA/SBI		page 27-28, page 32
Brazil			Dialogue[4]	page 61
Chile	√	SBI	Option of potentially introducing the item in the 2nd commitment period should not be excluded	page 4-5 (Add.1), page 8 (Add.1)
Costa Rica		SBSTA/SBI	Option of potentially introducing the item in the 2nd commitment period should not be excluded	page 66
Gabon[5]	√	SBSTA/SBI	Option of potentially introducing the item in the 2nd commitment period should not be excluded	page 73-75 page 77 page 78
Norway		SBSTA	Further consideration under the Dialogue, AWG[6]	page 100, page 102
Panama[7]	√	SBSTA/SBI		page 105-106, page 108
Peru[8]	√	SBI	Option of potentially introducing the item in the 2nd commitment period should not be excluded	page 110-112, page 114
Switzerland		SBSTA		page 10 (Add.1)
Uruguay		SBSTA		page 11 (Add.1)
United States of America		supports a process under the UNFCCC		page 122

[1] FCCC/SBSTA/2006/MISC.5 and Add.1

[2] This submission is supported by Bulgaria, Romania, Croatia, Albania, Bosnia and Herzegovina, Serbia and Montenegro, former Yugoslav Republic of Macedonia and Turkey.

[3] This submission is supported by the Central African Republic, the Dominican Republic and the Solomon Islands.

[4] Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention

[5] Gabon on behalf of Cameroon, Chad, Congo, Gabon, Equatorial Guinea, the Central African Republic and the Democratic Republic of the Congo.

[6] The Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol

[7] Panama on behalf of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

[8] Peru on behalf of Colombia, Costa Rica, Ecuador, Mexico, Nicaragua, Panama and Peru. This submission is supported by Bolivia.

Annex II

Country experiences and exchange of information

A. Bolivia[1]

1. Climate Change and its Implications in Bolivia

The GHG emissions from Bolivia reach only 0.097% of the Global emissions,[2] 80% of which come from the land use and land use change and forestry (LULUCF) sector. As for the scale of its energy sector, the emissions of the whole country are so small, that only one urban area from the United States, namely Manhattan, has 26.74 times the emissions of the energy sector of Bolivia.

The impacts of climate change have been growing in the last decades, with the presence of extreme events like droughts and floods, with the alarming retraction of glaciers (more than 60 % in some cases) and consequently higher levels of vulnerability in natural ecosystems, water resources, food security health and lost of infrastructure.,

Recent evaluations in Bolivia have shown that extreme climatic events produced an estimate of 250 millions losses in the agriculture sector, cattle ranging and road infrastructure for the hydrological year 2005-2006. Health risks due to the expansion of disease vectors due to temperature and rainfall and humidity patterns changes have increased especially in the case of malaria and dengue among others.

In parallel, poverty problems related to environment degradation and the increment of vulnerability to climate change enhance the problem. Unfortunately the major impacts are foreseen in the rural areas where more of the poor people live. The main issues to consider when analyzing rural livelihoods[3] are:

a) **Dependence on the ecosystem**, the rural population depends directly from the use of natural resources and environmental services from the ecosystems as a primary or secondary support of their life system. Forest ecosystems provide basic requirements, fuel, food, medicines and shelter. The lost of these ecosystems increases the vulnerability of rural populations.

b) **Access to water:** scarcity of water is already a major problem in arid and poor areas of the country, and excess of floods in plains. The lost of forests upstream in watersheds along without adequate management has increased frequency and intensity of floods. Additionally, the reduced development of hydraulic infrastructure determines a strong vulnerability to lack of water because the country is not prepared for this type of events.

c) **Access to land use,** the limited access to productive land is other aspect that might be worsened by climate change, due to the reduction of productive areas as a consequence of temperature rise.

d) **Forest resources degradation,** Bolivia has high deforestation rates, around 250,000 ha /year and there is a tendency to increase this number. The emissions for 2000 from the land use and land use change sector represent 80% of the total GHG emissions which come from a combination of energy and land habilitation uses. This clearly shows the high potential of the country to participate in the climate change battle through the reduction of deforestation.

[1] FCCC/SBSTA/2006/MISC.5, pages 35 to 47.
[2] Based on IPCC estimations for 1990 and national inventories of GHGs for 1990 for Bolivia.
[3] Plan Quinquenal del Programa Nacional de Cambios Climáticos.

The main goal of all strategic instruments both in adaptation and mitigation are created to generate development policies for poverty eradication through the sustainable use of natural resources.

2. Present Deforestation in Bolivia

Bolivia is among the 10 countries with greatest biodiversity in the world – a megadiverse country. More than 52% of the Bolivian territory is covered by forests. It is the sixth country in the world in terms of the highest quantity of natural tropical forests and world leader in the voluntary forest certification of natural tropical forest with over 2 million hectares certified. Forest loss is a current and real threat to the conservation of Bolivia's natural resources, biodiversity, economic growth and development. Over the period 1993-2000 the Forest Superintendency estimates that the annual national average of deforestation was 270,333 ha. In 2004 large scale deforestation (> 25 ha) reached 276,000 ha. Principal drivers for this trend are land use change to cash crop production and cattle ranching, forest fires, illegal logging, and new settlements.

a. Legal Framework

Bolivia has made enormous efforts to improve and to support the sustainable use of natural resources. The legal and institutional framework related to the use of natural resources is very well developed.

Bolivia has two laws which directly regulate land use in the country, the first one is the law on environment (No 1333) approved in 1992 and the other is the Forest Law (no 1700) approved in 1996. Both laws have the aim to regulate human en relation to nature, and the environment. Besides, there's the Law on Land Reform (Ley 1715) which was established in 1996 to improve the unclear land tenure situations in the country and regulate access to land.

Bolivia's forest development policy takes the principles of sustainable development as guidelines for meeting socio-economic challenges, managing the natural heritage, organizing technological updating and building institutions.

b. Forest management: legal framework and actors

The approach mentioned above was incorporated when formulating Forest Law 1700, which represented the country's first application of sustainability principles per sector. This law established a Forest Code, which has the objective of regulating the sustainable use and protection of forests and forest lands for the benefit of present and future generations, while coordinating such activities with the country's social, economic and environmental interests.

The forestry régime of Law 1700 extended access to the forest and its benefits in Bolivia. This law norms the use of forestry lands, opening the way for new sectors, and improving the conditions for all those who want to work in the Bolivian forestry industry. In the case of forest use, the situation demanded orientation and laws that balance economic, social and environmental aspects. Since the application of this Law, access to forestry resources has been transformed, formally including rural settlers, private properties and the TCOs within the new régime. Nowadays Local Social Groups (ASLs), the Original Community Lands (TCOs) and the private farms on the land, are added to the already-existing concessions scheme.

The regulations, especially regarding the use of natural resources, are indispensable to safeguard these resources, and to be able to sustain productive activity over time.

Without doubt, implementation of the Law implies a process of technology transfer, adopting new practices and forms to undertake the work. However, the results seen today demonstrate that it is a régime

that guarantees the forestry sector's sustained stability and growth.

Under Bolivia's new Forest Law, the institutional structure of the forestry sector when created was: the Ministry of Sustainable Development and the Environment is in charge of implementing the Forest Code as national policy-making institution, the Superintendence as regulatory institution and the National Forest Development Fund as financial institution, while prefectures and municipalities provide support. The Regulatory System for Renewable Natural Resources, also established by the Forest Law and working with the Forest Superintendence, has the objective of regulating, controlling and supervising the sustainable use of renewable natural resources.

Currently, 47 ASLs, and 35 TCOs have been formed in the country. There are 208 private properties and 78 concessions, with a total of approximately 8 million hectares. Of these forests, 2 million hectares have voluntary forestry certification, and Bolivia has become the world's leading country in this reagard. This demonstrates that the forestry régime regarding its environmental variable is working, and the forestry actors are applying a Law that is indispensable for the country.

The forestry areas granted in concession to companies total 5,091,086 hectares, all under General Plans of Forestry Management. This means that, of the forestry actors in Bolivia, they are the ones that work the greatest forest areas, protecting this natural resource based on Forestry Law 1700.

The following table shows who are the main actors by right in the forest sector and how they have been increasing over time.

Table 1. Forest access by right (hectares managed according to authorised plans)

Year	Industrial* Concessions	Local Community Associations	Long-term* Concessions	Indigenous Territories	Private Properties	Total
1997	5,498,017	0	361,721	0		**5,859,738**
1998	5,516,615	0	339,000	121,609	93,44	**6,070,667**
1999	5,330,853	0	294,022	141,150	199,791	**5,965,816**
2000	5,302,520	0	294,022	238,259	239,670	**6,074,471**
2001	4,972,447	407,721	112,000	444,406	351,344	**6,287,918**
2002	4,443,012	423,203	112,000	555,681	561,911	**6,095,807**

Source: Boscolo y Vargas 2002. In Bolivia case study illegal logging Chap 9

Access to forestry concessions is through the Forestry Superintendence, which calls a public bid to grant each concession, on the minimum base of annual forestry rentals and the list of referential prices established by the Ministry of Sustainable Development and Environment. That is to say, the best offer is awarded the concession. It must be noted that to date, and since the approval of Forestry Law 1700 in June 1996, no bids have been held. The current concessions existed prior to the Forestry Law.

Like other forestry actors, the concessionaires must follow the procedures in the Forestry Law, which regulates the use of this natural resource. As an indispensable requirement to initiate forestry operations, the concessionaire must have the respective management plan approved, and realize the technical instruments called for by the norm.

Forestry concessions are granted for 40 years, renewable every five years, after an audit of fulfillment of the Program of Sustainable Forestry Management.

Forest Management Regulations are of a very high standard reason why Bolivia companies and indigenous territories have been able to certify 2 million hectares of natural forest according the criteria of

the Forest Stewardship Council (FSC) Certification is an instrument, a group of steps that protect the environment and social surroundings. This provides an evaluation of the baseline for the forest, and the planning of productive capacity, taking into account the social factors surrounding the production.

Finally, it gives a long-term strategy of the future goals of that forest, and not only how to manage the forests but also how to develop the chain of custody.

However it is necessary to recognize the differences between the actors and their need to use the forestry resource, involving forestry management so that it is productive. This way, the national, foreign, large and small investor should have an investment modality with sustainable forest management. The design of forestry policies that consider these differences and promote use of the forest resource is important.

In this regard the Original Community Lands (TCOs) are rural areas granted to the country's communities of native people. For the native people, such as the Confederation of Native People of Bolivia (CIDOB), the TCO constitutes "the global space where the social and cultural experiences, the animals, the forests, the air, the waters and the human being develop; are interrelated and interact; all this comprises the territory." Under this view, the State gives preference to their requests for lands, and contemplates this in the Law, also guaranteeing exclusivity in forestry use in the TCO properly recognized by the State.

The involved area dedicated to forestry use is subject to the Forestry Rental and its consequent Forestry Management Plan. According to the land's suitability for use, the TCO can have available determined surfaces for forestry use, which are worked by the community's native people. The number of jobs depends on the decision of each community. The more wood volume they want to use, the more jobs are generated for their members.

Currently, the TCO national demands is 17.7 million hectares, in which the total titled surface is 3.8 million hectares. Of these, only 441,285 hectares are dedicated to forestry production, equivalent to 12% of the titled lands.[4]

The forestry regime has prove to be able to demonstrate that maintaining forests and use them properly, development and poverty reduction can be achieved, nevertheless the 8.5 million hectares under this law represent only 16.0 % of the total forest in the country. The deforestation is still a risk in the rest 84% and therefore there is the need to strengthen the implementation of the Law and to use new mechanisms to provide alternatives to land use change. **Environmental payments for reducing deforestation has the potential to complement all the effort already done in the country**.

3. Noel Kempf Mercado Project: Reducing deforestation experience in implementation

The project began in 1997, when 832,000 hectares of tropical forest adjacent to the Noel Kempff Mercado National Park in northeastern Bolivia, where large areas of the forest were threatened with timber harvesting and deforestation. The Government of Bolivia through the National Program of Climate Change, a Bolivian conservation organization: Fundación Amigos de la Naturaleza (FAN) and The Nature Conservancy created the Noel Kempff Climate Action Project. Together with three energy companies, the partners terminated the logging rights and the land was incorporated into the national park. Then the project partners launched a rigorous scientific program to measure the carbon stored in those 832,000 hectares and the carbon emissions avoided by the project.

[4] Bolivian Forestry Chamber

In November 2005 an internationally accredited certifier evaluated and certified the Noel Kempff Climate Action Project design and its emissions reductions. It is the first forest emissions reductions project to be fully certified using rigorous standards based on those used in the Clean Development Mechanism. The Noel Kempff project provides an excellent working example of how carbon sequestered in the living biomass of forests, and emissions reductions achieved through forest conservation, can be scientifically quantified, monitored and certified.

This type of activity will need to be accomplished at a much a larger scale to make a significant difference to greenhouse gas concentrations.

The results of that monitoring and third party certification show that from 1997 to 2005, a total of 989,622 tons of carbon dioxide that is sequestered in the forests would have been released into the atmosphere if not for the project.

Table 2. Bolivia: land tenure and forest rights

Land distribution by type of owner	Area in thousand ha		With approved FMP (a)
	Highlands	Lowlands	
Forest areas in the country	8,900	44,500	8,500
Total forested lands (b)	4,018	24,682	
Permanent production forest areas (c)			
Private lands by actor	4,381	43,249	1,078
Medium- and large-scale farmers (d)	1,323	3,744	723
	10,678	2,151	
Small-scale farmers (d)	12,111	19,516	
Community lands (d)	749	4,249	
Indigenous areas (TCO) claimed and admitted (e)	178	56	
Indigenous territories (TCO) titled areas (e)			
Number of indigenous demands (e)			
Forestry rights in public lands	0	5,399	5,399
Forest concessions (f)	0	2,500	906
Forest concessions for non-timber products (g)	0	2,200	488
	0	488	
Municipal forest reserves (h)	4,237	14,096	
Long term contracts and research concessions (f)			
Protected areas (i)			

Notes: a) areas in lowland Bolivia with an approved Forest Management Plan (FMP) in 2003. Information based on annual reports of the Superintendencia Forestal (SF), taken from Terrazas (2005), b) areas with any type of forest cover taken from MDSMA (1995), c) areas declared for sustainable forest management according to DS. 26075 of February 2001, d) correspond to land distributed by INRA and INC from 1953-2002, based on Balderrama (2002), e) based on INRA, f) adapted from SF (2005), g) personal communication from Director of Land Sanitation, INRA, h) data obtained from Direcci—n Forestal, MDS i) quoted in Bojanic (2005) based on SERNAP.

a. Project Actors

Project Developers/ Managers: The Nature Conservancy and Fundación Amigos de la Naturaleza (FAN)
Project Investors: Government of Bolivia, American Electric Power Company (AEP), BP-Amoco, PacifiCorp
Lead Carbon Measurement Partner: Winrock International Institute for Agricultural Development
Certification: Emissions reductions, certified in November 2005 by Société Générale de Surveillance (SGS)

b. Main Project Benefits

■ Emission reductions: Without the project, 989,622 tons CO2 would have been released into the atmosphere between 1997 and 2005

■ Carbon benefits from the project guaranteed through 2026

■ Preserves a rich and biologically diverse forest ecosystem among the Amazonian, Chaco and Cerrado ecoregions

■ Residents of villages in the park achieved legal status as "Communities of Native Peoples," and application for their official land title is under way

■ Provides alternative, environmentally sustainable economic opportunities for the local population by the establishment of a community forestry program among others.

c. Project Design

Carbon Credits: Carbon emission reductions were generated by this project through two specific activities:

i) Deforestation avoidance through cessation of logging in former concessions.
Logging right of concessions previously operating in the project area were retired with funds generated for project activities.

ii) Enforcing the deforestation ban in protected areas within the park by reducing slash-and-burn agriculture and initiating alternative income programs for the surrounding communities.

Additionality: The project provided carbon financing to stop logging in the park and deforestation around communities. Without this funding, these activities would have continued, leading to the loss of forest cover and release of carbon dioxide.

Project leakage: A non-linear dynamic optimization model was used to quantify how the project might cause the loss of carbon benefits outside of the project boundary (e.g., shifting timber production elsewhere in the region and reducing the overall carbon benefits of the project). The project included programs and activities explicitly designed to minimize leakage as much as possible. Project partners detected the leakage was arising in three ways: a shift of logging to areas outside the project boundaries, logging by communities in former concessions and shift of domestic timber supply internationally. From 1997 to 2005, project partners calculated a loss of 171,618 tons of CO2 benefit from leakage. This loss was factored into the calculation of the final net carbon benefits from the project.

Permanence: The project area is now protected under the auspices of the National Service of Protected Areas and FAN Bolivia. The project finances 27 rangers and an infrastructure to protect the park.
Monitoring: The project design includes a comprehensive plan to monitor biomass increments, socioeconomic impacts, development of timber markets and deforestation dynamics.

Certification: The certification process involved assessing the project's design document and methodologies. These included assessment of additionality, baseline, leakage, monitoring, and environmental and social impacts.

3.1 Community development

Local communities are responsible for and beneficiaries of forest conservation. To improve the livelihood of the seven communities living out and inside the park and to strengthen their organization structure two sequential programs have been initiated. APOCOM (1997-2001) improved access to basic services (health, education, communication), PRODECOM (2002 –2006) emphasises community development by securing land titling, self-organisation, and income generating activities (community forestry, micro enterprises). Amongst others, the following activities have been supported:

a. Organization empowerment: Traditional organizations and grouping of indigenous councils into the Central Indígena Bajo Paraguá (CIBAPA) has been supported. Today, CIBAPA is registered as an organisation with legal standing representing the indigenous communities around the park.

b. Land tenure and community property rights: Before the project started, none of the communities bordering the park had any property rights to the land they had historically live on. Today, the entitlement demand of 360,565 ha of Native Communal Land has advanced by nearly 80% of its due course.

c. Elementary and high school education: Scholarships were given to 120 students to continue their studies in courses that are not available in the communities.

d. Capacity training: 4 communities were trained in sustainable community forestry. Agricultural promoters were educated and special scholarships in strategic areas (business administration, tourism, agricultural and forest engineering) financed.

e. Income generation: Amongst other income generating activities the project supported the elaboration of the community forest management plan and the establishment of the community forest concession. Today, IBAPA is running its own sawmill being the first indigenous community with a timber selling point in the capital of the Department of Santa Cruz.

f. Land use planning: To enhance access to livelihood means and to mitigate leakage the project financed the elaboration of a land use plan covering the overall indigenous territory.

g. CERS benefits: The Government of Bolivia owns a 49% of the emissions reductions achieved in the lifetime of the Project, after cashing the CERS the money generated will be use as follows: To cover the activities of park protection and fundamentally to support the communities development and wellbeing.

The project represents a success history, first for the institutional framework where the government of Bolivia along with national and international NGOs, and Energy Companies has been able to support the implementation of the NKMP, improving the park and overall supporting the sustainable development of the communities, while providing a service to the world reducing GHG emissions that are certified. This is an example proving that this can be done in a technically and scientifically manner but also supporting sustainable development in the host country.

4. Financial Instruments use to secure resources for National Parks system

The National Protected Areas System (SNAP) was established by the Government of Bolivia in 1992, and presently includes 22 protected areas of national interest covering 10.68 million of ha (representing 17 percent of the Bolivian territory) of which 19 areas (encompassing 15% of national territory) are currently under SERNAP management. SNAP is very ambitious, given the human and financial constraints Bolivia faces. The Government of Bolivia (GOB) has taken steps to establish a policy framework to support biodiversity conservation and to closely link this to social development and poverty alleviation.

The Foundation for the Development of the National System of Protected Areas (FUNDESNAP) was created in 2000 and is legally recognized as a private foundation by the La Paz department prefecture. Its mission is to raise, channel, and administer financial and non-financial resources that enable the National Service of Protected Areas (SERNAP) to advance the principles, policies and strategic goals of Bolivia's National Protected Areas System (SNAP).

FUNDESNAP currently manages $11.1 million in permanent endowment funds, a $2.1 million sinking fund from which both capital and earnings may be spent, and $4.8 million in project funds. As a private, non-profit foundation, FUNDESNAP is characterized by transparent procedures and is free from political interference. Given it role in supporting SERNAP, it is operationally linked but not subsidiary to the Bolivian government.

In five years, FUNDESNAP has demonstrated the financial management and administrative capacity needed to realize conservation and development goals in Bolivia's protected areas. The initial impetus for its formation was the failure of a public entity to adequately manage public resources intended to generate investment income and project funds to cover Bolivia's protected area costs. Endowment resources totaling $9.95 million were transferred to FUNDESNAP management in 2001 and have grown an average of 6.9 percent per annum over the last three years under its stewardship. Previous management had attained a return of only 1 to 2 percent on average over 4 years. FUNDESNAP's maximum decision-making and representational body is its founder's Assembly comprised of nine representatives of the Bolivian government, the private sector, civil society, international cooperation, and representatives of the protected area management committees.

FUNDESNAP financing ensures that the best technical tools are available and used to advance protected area management including the Protected Areas Planning System (SIPAP) and Monitoring Effective Management System (MEMS). The SIPAP provides an orderly framework for the generation of annual operating plans for each area and for the overall protected area system. At present, six of the eight areas have long-term management plans. The MEMS, based on The Nature Conservancy's Scorecard, monitors the fulfillment of planned activities. With Critical Ecosystems Partnership Fund (CEPF) support, SERNAP is currently working to strengthen this system. Ultimately, SERNAP aims to take its planning and monitoring efforts beyond protection and distraction to enable others to work effectively on environmental education and sustainable development.

FUNDESNAP and SERNAP together present the institutional capacity needed to finance and implement long-term management of Bolivia's protected areas.

This represent a good experience for a public and private framework that can manage financial resources, capacity that is require for the implementation of incentive mechanism on the ground for reducing emissions from deforestation.

4. Technical and scientific aspects

The following points outline some technical and scientific recommendations based on Bolivian experiences and the ongoing dialogue between the Government of Bolivia and Bolivian institutions focusing on forests and deforestation.

a. Definition of forest cover
Considering, that changes in some non forest vegetation types might cause considerable emissions, too, de-vegetation of non forest areas should be taken into account, in a broad analysis of definitions.

b. Types of eligible interventions
The Marrakech Accords define deforestation as "the direct human-induced conversion of forested land to non-forested land" (FCCC/CP/2001/13/Add.1 p. 55). Apart from that, forest degradation and devegatation are leading to substantial anthropogenic GHG emissions (IPCC 2003) and should be included in a system of Full Carbon Accounting in post 2012. Based on this comprehensive approach, the following activities should be considered under a comprehensive accounting system of avoided LULUCF emissions:

- Deforestation
- Selective logging
- Shifting and shifted cultivation
- Fires
- Other types of intervention (roads, settlements, clearing, fragmentation)

c. Quantifying and monitoring area of eligible interventions
To allow for internationally consistent accounting procedures, standards for classification schemes, data processing, and monitoring should be established. Today, state of the art methods in remote sensing, forest inventories and biomass measurements are available to accurately measure and detect changes in carbon forest stocks:

- Bolivia is already monitoring large scale deforestation annually, using the MODIS product MOD13, which detects deforestation exceeding 6 ha with an accuracy of 80%. Cross comparison with data of LANDSAT ETM class sensors can increase this accuracy, substantially.
- Fine scale measurements of land cover change are needed to track small scale deforestation (1 - 5ha) annually at a national level. Although the SLC failure of LANDSAT 7 represents a significant drawback, alternatives exist (ASTER, SPOT, DMC) providing high resolution data for monitoring at a regional scale.
- Recent scientific work (Asner et al. 2005) indicates, that it is technically feasible to detect, estimate and monitor forest degradation, specifically caused by selective logging. As this promising work is hampered by the fact that it builds on LANDSAT ETM efforts should be made to identify alternative data products suitable or this type of analysis.
- While wall to wall approaches to detect active fires and burnt area at medium resolution (250m-1km) are already operational (MODIS, AVHRR), detection of fire radiative power (FRP) is still at an experimental stage (BIRD). Processing FRP measurements showed promising results when converting the remotely sensed signals into a CO2 emissions estimate. Additionally, fire scarf mapping gives reliable estimates of GHG emissions t a regional scale (Archard el al. 2004).

These experiences show, that it is already technically feasible, to detect and monitor the impact of different types of forest degradation and deforestation at a national level with an appropriate temporal and spatial resolution. Taking into account the rapid technology change in remote sensing, further high-resolution sensor products will be available before 2012 to estimate GHG emissions.

Demand of Cost effectiveness, limited resources, or data constraints might impede a wall to wall monitoring of all activities in the beginning. Thus, a subnational monitoring and projection of selected interventions (fire, logging, slash and burn) should be allowed during an initial phase. These measurements can be projected to a national level using robust scientific methods. Technology transfer and training in remote sensing, as well as preferential data access for developing countries at minimum cost are important to improve the monitoring capacity in tropical countries.

d. Quantifying and monitoring emissions

Accurate biomass measurements for each forest type are needed to convert area measurements to emission volumes. Multilateral institutions like IPCC and FAO already facilitate the exchange of measurements and methodologies. Joint efforts are needed to establish consistent inventory approaches covering agreed vegetation classes, calibration and monitoring protocols. Complementary remote sensing based mechanisms (LIDAR, airborne videography) to directly measure biomass have been tested, successfully, and might be operational in the near future.

Carbon accounting schemes at a national scale should build on already agreed methods: IPCC GHG inventory methods (IPCC 1996, and currently under revision) and the LULUCF GPG (IPCC2003) already contain methods and default values for various processes and pools. Soon, revised guidelines will be available (IPCC 2006 AFOLU Guidelines forthcoming).

Both, already operational remote sensing and state of the art biomass measurement methods provide for valid data to establish national accounting schemes of emissions from deforestation, degradation, and devegetation.

e. Key elements of a baseline approach

To provide for robust projections of avoided deforestation, degradation, and devegetation agreed definitions are needed on historical baseline periods, projection methods, and validation procedures.

As deforestation, degradation, and devegetation show different regional dynamics in tropical countries, each Party could propose country specific base line periods. Parties with large forest cover, relatively low deforestation rates and low economic development should be allowed to use higher deforestation rates in their projections than countries with low forest cover or good economic performance. Spatiotemporal coverage of remote sensing data is an important criterion to select the appropriate baseline period in differentiated country based approaches.

To establish robust projections the detected areas of intervention have to be related to corresponding biomass values. These biomass values might be specific for different vegetation types or a mean over a broad spectrum of different vegetations. Default values for various vegetation types already exist (IPCC LULUCF GPG 2003). Using them or other biomass measurements requires knowledge, where and how much deforestation, degradation, or devegetation will be avoided in the future. Different LULUCF models are already in use (i.e. GEOMOD, CLUE-S) to spatially project land use change. The Noel Kempff Climate Action Project (NKCAP) uses GEOMOD to allocate the projected area deforested based on change detection analysis (FAN 2005). Its certification shows, that this model complies with rigorous certification criteria used by SGS as a DOE. Spatial LULUCF modelling might play an important role in detecting areas under high risk of deforestation, degradation, and devegetation. Furthermore, model results can be used to allocate economic incentives to those areas, where marginal changes in profitability of sustainable forestry could make a difference.

Standards should be agreed, that allow for a model independent validation of spatially explicit land use change models. A feasible and rigorous proposal already exists (Pontius et al. 2004) and has been successfully applied in NKCAP. The use of mean values might be feasible, when it is impossible to allocate avoided interventions ex ante.

Avoiding deforestation implies that land use change will be avoided. Full Carbon Accounting approaches have to account for the biomass of avoided secondary land use using IPCC default values or other appropriate measurements as proxies, as well as robust assumptions about the type, spatial, and temporal distribution of this secondary land use.

The combination of principal and underlying causes of deforestation is changing over time: New roads are built, new settlements emerge, markets for timber and agricultural products show dynamic behaviour. Thus, the selected combination of drivers for deforestation, degradation, and degradation have to be revised periodically and, if needed, the baseline hast to be modified. Apart, baseline adjustments should be possible after an approved period, to count for technology change in remote sensing and LULUC-modelling.

e. Leakage

Leakage has been one of the main concerns preventing the Parties from including avoided deforestation Different aspect of leakage should be treated separately:

- The spatial domain: Leakage might occur at different scales. NKCAP shows, that leakage caused by activity shifting can be calculated using a combination of inventory, remote sensing, and econometrics' modelling approaches (Sohngen and Brown (2004); FAN (2005)) providing for robust leakage estimates at local, regional, and national scale. This approach is particularly useful to monitor leakage of project or regional based approaches. Avoiding deforestation in one country might leak to non-participating countries. International leakage remains an issue, but can be either reduced under a comprehensive framework for avoided deforestation of the UNFCCC or monitored extending already existing econometric models (Sohngen and Brown (2004); Murray et al. (2006)).

- The intra-sectoral domain: Reducing the intensity of interventions and limiting the amount of available land for land use change might change species' specific harvesting intensities in the forestry sector. This type of leakage can be monitored if appropriate remote sensing and inventory methods will cover all productive areas within a country.

- The cross-sectoral domain: Successful policies avoiding deforestation might cause factor price changes as land might get scarce. Scarcity of land might stimulate technological change in agricultural production eventually causing changes in inputs and throughputs and sector emissions. For example, a farmer might extend his cash crop production on a limited amount of land by a more intensive use of fertilizers. Economic input-output models are suitable to estimate these effects, if appropriate.

In general, leakage can be estimated with state of the art remote sensing technology and econometric modeling approaches. Thus, leakage should no longer be used as an argument against including avoided deforestation under the UNFCCC. As the current definition of leakage within LULUCF relates to project based approaches, a more comprehensive and operational definition should be agreed considering different sectoral and spatial domains. SBSTA should have a closer look at the issue of international leakage in general, and recent econometric modeling approaches, in particular. Furthermore, SBSTA should stimulate scientific exchange on these issues.

f. Additionality

As deforestation is constantly increasing on a global scale, one could argue, that national reductions of deforestation rates under an extended comprehensive climate regime are per se additional. Nevertheless, the issue remains, that efforts to reduce deforestation beyond UNFCCC will continue. ODA should have a complementary role in conserving global forests. Additionality can be ensured by comprehensive reporting schemes, which should document the efforts of the Parties in reducing deforestation, the origin of its finance, and the use of incentives stimulated under the UNFCCC.

g. Permanence

Different approaches are discussed to tackle the challenge that avoided LULUCF emissions show higher permanence risks. If parties identify certain areas, where emissions are avoided and appropriate leakage monitoring is operational, changes in vegetation cover can be monitored. Banking carbon credits as a risk buffer for future commitment periods could be appropriate, too, depending whether a Party will choose either binding or nor-regret targets.

h. Full carbon Accounting

Current provisions under the Kyoto Protocol (KP) led to a fragmentation and inconsistencies in the LULUCF system. Considering, that human activities in forest, cropland, rangeland and grasslands can have significant impact on the level of emissions, a more comprehensive approach is needed in a post 2012 climate regime. Art. 3.3, 3.4 and 3.7 already allow for Annex I countries to include revegetation, forest management, cropland management, and grazing land management into their emission accounting. A Full carbon Accounting Approach would allow for a comprehensive accounting of all stock changes on terrestrial surfaces.

END

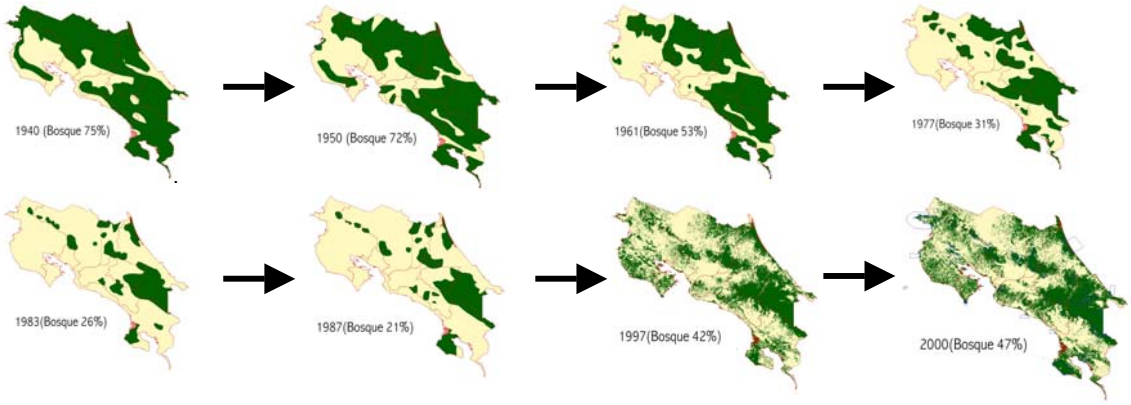
B. Costa Rica[1]

Costa Rica is a country of 4 million inhabitants, covering 5 million hectares on the Central American isthmus. The oldest democracy in Latin America, it has a per capita income of US$ 4,670 (2004), a high literacy rate, a rapidly growing population and energy demand. Its most important economic sectors are: tourism, manufacturing industry, services and agriculture.

Costa Rica contains 5-7% of the world's biodiversity. More than 75% of Costa Rica was covered by forest in 1940. However, its land area today is less than 50% forested. Approximately 1.5 million hectares of forest remain, most of which is under government protection of some type. Outside those areas, however, deforestation and forest degradation has proceeded rapidly, resulting in an increasingly fragmented forest landscape.

Based on land use capability, less than 40% of Costa Rica´s land is suitable for agriculture and approximately 60% is suitable for forests. Of the 35% of Costa Rica´s land in pasture, only 8% is appropriate to that use.

Figure No 1. Deforestation in Costa Rica



The establishment of the National System of Protected Area (SINAC) under the Ministry of Environment and Energy (MINAE) in 1995, resulted in a unified but decentralized system for administrating protected areas and coordinating conservation activities on a regional basis. The expansion and strengthening of the country's protected area system has been important in arresting the loss of forest.

As in many Latin-American countries, formal protected areas in Costa Rica comprise lands under a range of different tenure status, public and private. Because Costa Rica's constitution strongly emphasizes private property rights, there has long been uncertainty about the degree of actual protection afforded in protected areas that are not securely registered as part of the national forestry patrimony of the state.

This can be overcome through outright purchase of private lands, and through a variety of legal procedures and surveying activities necessary to regularize and transfer the ownership of these forested lands as a forestry patrimony of the state.

The Costa Rican government has a goal of bringing 25% of the national territory under state protection, including ecologically valuable areas that contain 90% of its biological diversity. It hopes to achieve this goal partially through enhancing the privately owned forest lands that serve as buffer zones around the state owned areas.

[1] FCCC/SBSTA/2006/MISC.5, pages 48 to 50

In 1996, Costa Rica adopted a new Forestry Law (No. 7575), which explicitly permits landholders to be compensated for providing environmental services. The Forestry Environmental Services Programme (FESP) under the new forestry law recognizes the following environmental services:

Carbon Emissions Reductions: is the largest monetizable forest environmental service. By refraining from deforestation, the Costa Rican landholder reduces carbon emissions to the atmosphere, and thereby reduces the economic impacts of global climate change.

Biodiversity: The potential loss of biodiversity has probably been the largest source of concern surrounding deforestation in Costa Rica. Much of this biodiversity, however, is not represented in protected areas and is therefore at risk. Biodiversity has instrumental and intrinsic values. The instrumental values include contributions to revenues from ecotourism and from bioprospecting ventures; these values accrue at the national level. The intrinsic values include the "existence value" or notional willingness-to-pay for preservation.

Watershed protection: Loss of forest cover can result in erosion and sedimentation of streams and rivers. Sedimentation reduces the quality of drinking water. Siltation also penalizes hydroelectric power generation by reducing the effective size of reservoirs, and by damaging equipment. Loss of forest cover can also result in 'peaky' response of streamflow to rainfall. This increases the risk of flooding, and results in the loss of potential electricity generation at run-of-river hydroelectric plants, as the excess water is spilled-over and lost for energy generation purposes. Under some circumstances, it is conceivable that deforestation could reduce dry season basic flows.

Ecotourism and scenic values: Forests are an attraction of growing importance to Costa Rica's large tourist industry. The annual number of visitors to the national parks has ranged from 500 to 600 thousand visitors in recent years.

Implementing rules, including sources of financing (e.g. local fossil fuel tax and loans from multilateral entities) and rules for disbursing forestry environmental services payments mainly through conservation of forested lands, were adopted in 1997. Since its inception funds are channeled through the National Forestry Financing Fund (FONAFIFO), which had been established in 1991 to handle an earlier generation of forestry incentives.

Some services are provided directly by the government from national parks and other public lands; however, the most innovative part of the system is the provision of services by private landowners under contract. Under the later, the obligation to protect the forest for a period of 20 years is noted in the public land register and applies to future purchasers of the land.

Costa Rica’s new approach to forestry links the provision of environmental services from the financing of these services. The Government acts as an intermediary in the sale of services. Funds from the sale of these services to domestic and international buyers are used to finance these services. However, there is substantial excess on demand for over the availability of funds.

The government of Costa Rica foreseen the financial compensation for carbon offsets related with the reduction of deforestation as the major potential funding source for the territorial consolidation of the SINAC and the financial sustainability of the FESP program, the two main environmental debt of Costa Rica.

The former is addressed by the Protected Area Project (PAP), by placing 422,800 hectares of land in national parks and biological reserves, under the firm legal ownership of the state in exchange of its claim to avert the release of 11 million tones of carbon under a 20 year stream of offsets. Offsets will be

compensated in four annual tranches. The key assumption is that in the absence of external project financing, the government would be limited in its ability to prevent deforestation.

The later, the Private Forestry Project (PFP) will be similar to the PAP. However, the offsets will be based on averted deforestation on private lands. These actions will be accomplished by funneling offsets revenues through the FESP program. The ultimate scope of the project has not been precisely determined but it could encompass more than 700 thousand hectares.

Therefore, Costa Rica supports the development of a market of carbon offsets as a mean to stimulate action to reduce emissions from deforestation in developing countries, either as a voluntary contribution to environmental improvement or in order to meet local regulatory limits of emissions.

END

C. Nicaragua[1]

1. Impacts of Climate Change

Nicaragua, because of its geographical position, is part of a very vulnerable region due to the continuing occurrence of the extreme events, such as tropical storms and hurricanes, and to the climatic variability caused by ENSO.

Conservative estimates of the costs in damages Hurricane Mitch left behind are of approximately US$8.5 Billion dollars, and amount which is greater than the Gross Domestic Product of Honduras and Nicaragua together, the two countries more adversely affected by this extreme event. It is more than evident that this extreme event had at least a ten year set back on the development process of Nicaragua.[2]

The vulnerability to climatic events rises in magnitude and intensity due to the deforestation process, land erosion, sedimentation, advancement of the agricultural frontier, inadequate use of land resources and to the deterioration of natural resources in general. This vulnerability also increases due to the poverty conditions, high and extreme, in which a great portion of the rural population live, as well as to the reduced socioeconomic opportunities they have.

It is highly probable that climate change will greatly affect Nicaragua, and this will be manifested through an increase in the frequency and severity of extreme events and climatic variability.

To evaluate the degree of vulnerability and the possible impacts of climate change in the country several projections were made utilizing the General Atmospheric Circulation Model (HADCM2) to se how the climate would change in Nicaragua in different time horizons of time (2010, 2030, 2050, 2070 y 2100).

a. Temperature

According to the results from the climatic scenarios, an increase in the average annual temperature (AAT) for 2010 could be between .0.8 y 0.9° Celsius for the three scenarios (pessimist, moderate and optimist) in both the Pacific and Caribbean regions. For the year 2050, the AAT, under the pessimistic scenario, could increase between 1.9° (Caribbean region) and 2.1°C (Pacific region); under the moderate and optimistic scenarios the AAT could increase between 1.5° y 1.7°C. By 2100, the uncertainty is greater and the values of the AAT is likely to increase between 3.3° - 3.7°C in the pessimistic scenario and 1.9° - 2.1°C in the optimistic one.

b. Sea Level

The estimated sea level rise, based on the climate change scenarios, has not been significantly studied in Nicaragua and there is an urgent need to do so.

c. Changes in climate

For Nicaragua, climate change scenarios show the tendency toward a drier future climate, with less precipitation, reduced surface runoff water, less cloudiness, greater temperatures and evaporation, all of which will have an impact on the hydrological cycle. The increment in the occurrences of extreme events and climatic variability sets the future of certain economic activities and sector at great risks.

---

[1] FCCC/SBSTA/2006/MISC.5, pages 51 to 56

[2] Janet N. Abramovitz, "Averting Unnatural Disasters" in “State of the World”, Chapter 7 pp. 123-142, 2001.

With regards to the average annual precipitation, a general decrease is foreseen for all the scenarios. For 2010 this reduction could be between -7% to -10%; for 2100 the pessimistic scenario shows values of -36%, the optimistic -21%, both in the Pacific and Caribbean regions. Considering the reduction of precipitation the more significant changes in the Pacific region is expected in the dry lands/areas, especially in the northern part of the municipalities of Leon and Chinandega. This poses a worrisome scenario, especially because some of these areas could enter into a process of desertification, something which in turn might limit rained agricultural areas and that in turn could reduce food security at the national level.

d. Relationship between forest cover and adaptation

The Nicaraguan territory, of which 11.9 million de hectares are above sea level, most of it, 6.6 millions (55.3% of the total), are cataloged for forestry use, conservation of wild life and biodiversity, including the areas for ecotourism, such as swamps, beaches, mangroves, among others. The rest, 5.3 million hectares (44.7%), have good conditions for agricultural and cattle production, but only 6.9% of that area is good for agriculture.

In the last 50 years deforestation, pushed primarily by the agricultural frontier and population growth, has had significant consequences over land use patterns. Between 1960 and 1998, 6.3 million hectares previously covered with vegetation changed its use to agricultural production/ cattle ranching. The must important environmental impact of this transformation was the substantive reduction of forest cover which decreased by half, from 8 million hectares to 4.

There are multiple causes for the lost of forest cover in Nicaragua, such as forest fires, pests, extreme weather events, slash and burn agriculture, the burning of agricultural residues, illegal extraction of timber, extensive cattle ranching and agriculture, among others. Just as an example, in 1998, Hurricane Joan damaged more than 500,000 hectares of dense forest.

The factors previously cited and the inadequate use of the land resources increases the vulnerability of the forest ecosystems. The use of lands with forestry vocation for agriculture and cattle ranching has caused massive erosion processes and the depreciation of land resources, affected the hydrological cycle and the local climate. The deforestation of the most important and watersheds and of the hillsides, increase the risks of floods, land slides, and puts the population in situations of high environmental vulnerability and risk. Furthermore, the advancement of the agricultural frontier results in environmental degradation and leads to the lost of biodiversity and water resources.

Furthermore, these circumstances have diminished the capacity of the forest ecosystems to adapt to climate change and this in turn has lead to an urgent need to promote a dual adaptation/mitigation strategy. This strategy should base itself in a process of land planning which takes into account the best use of the land based on its vocation, the development of policies and market mechanisms, the prevention of forest fires and the reforestation of the most important watersheds.

2. Data Drivers for Deforestation

In the first GHG inventory Nicaragua prepared there were great uncertainties with regard to the LULUCF sector, however it showed that the larger emissions of GHG came from deforestation and that the larger sink of GHG was the natural regeneration of forests.

These uncertainties are due to the lack of up to date data, regional and national, that could be provided by a Forest Inventory, which could have helped to quantify with greater degree of certainty the areas with forest and the annual rate of deforestation

With the preparation of the first GHG inventory, to correct the lack of data in this sector, the annual deforestation rate the, the method of "expert judgment" was utilized. A workshop was organized with national forest experts and an annual deforestation rate of 120,000 hectares was agreed by consensus for the period 1993-1995.

In addition, there is other important other forestry data which is not available in Nicaragua, such as the rate of natural regeneration of the different types of forest, the dynamics of abandoned lands, local emission factors from different forest types and soil carbon in areas with forest vocation. For the first GHG inventory, the lack of this data required the use of default factors (IPCC) which brought along greater uncertainty.

Nicaragua has approximately 55,977 Km² of forest, which represents approximately 43% of the national territory. Approximately 78% of the national forest is located in Atlantic region, 17% in the Central region and only 5% is located in the Pacific Region. (Forestry Map Ministry of Agriculture and Forestry, 2001) For more detailed information see tables I and II and the end of this document.

Of the total forest ecosystems cover, approximately 1,673,000 hectares, which represent 30% of the country's area covered by forest, is under some type/category of protected area and is part of the National System of Protected Areas (SINAP).

In 1983 the country estimated it had a total forestry cover of 76,668 Km². For the year 2000 the forest cover was estimated at 55,977Km². Of this total, a lost of 20,691 Km² is estimate, land change used which switch to agriculture/cattle production and settlements. Therefore, in 17 years Nicaragua lost 27% of its forest cover, this represents a rate of land use change of 1.6%. The principal effect of deforestation of the tropical forest, calculated between 65,000 to 150,000 hectares per year, is land erosion and its consequences that are multiple.

Much of Nicaragua's deforestation is concentrated along the nation's "agricultural frontier", a north-south line that extends across the country, moving eastward, ever closer to the Caribbean Sea. Along this frontier, forests are continually being burned or cut in order to clear the land for agriculture. It is clear that the poverty conditions of the rural population and their low employment rate have had an impact on deforestation. Sometimes the sale of timber for these Nicaraguans becomes the only source of available income.

Agricultural production including livestock made up 15 percent of Nicaragua's GDP in 2003. Coffee is still for Nicaragua the single largest export; it declined from an export value of $161 million in 2000 to $86 million in 2003 in the face of falling global coffee prices and lower-cost production in southeast Asia.

An upward trend in coffee prices in 2004 may help in a short-term recovery, but Nicaragua has focused efforts on developing a niche in production of specialty coffees as well as diversification to other crops.

Cattle production has grown steadily since 1998, coming close to coffee as an export earner. In 2003, exports of Nicaraguan beef, mainly to El Salvador, Mexico, and Honduras, were nearly $84 million. Sugar, Nicaragua's third most important agricultural export, declined from earnings of $49 million in 2001 to $26 million in 2003. Cotton, once a major export, virtually fell out of production over the 1980s and 1990s, but is experiencing renewed interest. Exports of non-traditional agricultural products such as peanuts, melons, onions, okra, and exotic fruits like pitahaya taken together were worth $103 million in 2003. Rice, red beans, and white corn grown mainly for domestic consumption, as well as high-quality tobacco for domestic production of exported cigars, are other important crops.

Forestry made up another one percent of Nicaragua's GDP in 2003. Tropical hardwoods including mahogany are both exported as logs and used in local furniture manufacture, but are subject to international environmental restrictions and tight governmental regulation.

The Nicaraguan government has not able to effectively prevent illegal logging. The National Forest Institute (INAFOR), the national institution in charge of stopping these illegal activities, has been highly limited by the lack of resources. According to information provided by the 'State of the Environment 2003" report (Estado del Ambiente en Nicaragua 2003, Ministerio del Ambiente y los Recursos Naturales) illegal logging generates great losses for the country, since a considerable percentage of the timber, that could be generating income and taxes, is lost through the border areas of the South and North of Nicaragua. According to this report, the amount of illegal logging can not be estimated.

The study and detection of forest fires through seven years (1996-2003) has showed that the most affected forest ecosystem is the tropical forest, broad leaf/evergreen, with a total of 12,774 fires, fallowed by the tropical deciduous/broad leaf forest with 4,203 fires.

Plagues have also affected the Nicaraguan forests. The 6673.78 hectares of pine forest disappear due to the most recent plague of the pine forest; the economic lost of this event has been estimated in approximately 39 million dollars.

The growing use of firewood, for basic energy needs, is putting great pressure on the forest ecosystems of Nicaragua, especially to the dry tropical forests located in the Pacific region of Nicaragua, where 60% of the population has concentrated.

3. National Experiences

The two most significant and recent actions with regard to the forestry sector have been the definition and approval of a National Forestry Policy and the enactment of a new Forestry Law. Both acknowledge that the forestry sector is fundamental and key for the socio-economic development of the country.

On June, 2003, the Nicaraguan Assembly passed "The Law for the Conservation, Promotion and Sustainable development of the Forestry Sector". The main objectives of this law are as followed: the sustainable management of the natural forests; the increase of the forest cover; the protection and conservation of the national forests; the promotion of research; and the improvement of technology used in this sector.

Thorough this law the Nicaraguan State establishes an incentive regime with the objectives of promoting the sustainable development of the forestry sector, the attraction of larger numbers of investors to the sector, the promotion of reforestation activities and the halting of the process of deforestation.

One of the greatest achievements of this new Law is that it makes clear that the owner of the land is the forest cover and the benefits derived from it. It also makes clear that the owner of the land is responsible for the management of the forest resource. It is expected that this simple legal clarification will lead to the increase investment in the sector, since this legal uncertainty was a previously identified barriers for investment.

This Law also clarifies the roles and responsibilities of the different institutions involved in the sector. It creates the National Administration of the Forestry System (Sistema Nacional de Administracion Forestal – SNAF), which is made up on public and private institutions involved in this sector. It also creates the National Forestry Registry, administer by the National Institute of Forestry (INAFOR). The National Fund for the Development of the Forestry Sector (FONADEFO) was also created by this law, with the objective of financing programs and projects that will help achieve the objectives of the Law.

It is still too early to evaluate the impact of this law on the national forestry sector, especially if you take into account that the normative for the use of the incentives regime it provides has just been recently developed.

Environmental Services Payment Experiences

In the past few years pilot efforts have been made in Nicaragua to use environmental services payment schemes to promote the protection of forests which provide environmental services to communities. These pilot experiences have been mostly small and centered around the provision of water related environmental services.

Most of these pilot experiences with environmental services payment schemes have demonstrated that they can help reduce deforestation and increase forest cover. The Program for Sustainable Agriculture in the Hillsides of Central America (PASOLAC) has been key in the development of these initiatives and through them it has been demonstrated that small scale ES initiatives can help protect forest and increase forest cover, as well as help improve the conditions of the small farmers. Furthermore, the first studies of the PASOLAC cases clearly show that the quality and quantity of water has improved.

The Ministry of the Environment and Natural Resources is presently leading an initiative aimed at developing the institutional and legal framework which will allow the country to implement these Environmental Services Payment Initiatives in larger scales and numbers, and in the long run a national system/program for ES. Capacity Building and sharing of successful experiences with the implementation of environmental services payments are needed at the national and local levels. Bilateral and multilateral climate change programs should promote south/south cooperation and the exchange of experiences on use of this type of financial mechanism, which has proven to help stop deforestation and promote reforestation.

Table I: TERRITORIAL COVER

Type of actual land use	Área (Km2)	% percentage per/type
Open Broad Leave Forest	19,401.53	14.88
Closed Broad Leave Forest	31,683.44	24.30
Open Conifer Forest	3,950.15	3.03
Close Conifer Forest	1,160.21	0.90
Forest Fallow	4,836.20	3.73
Bush type vegetation	4,618.87	3.54
Agriculture/cattle	48,875.06	37.49
Mangroves	690.47	0.53
Wetlands	1,419.93	1.00
Grassland	2,379.19	1.82
Palm forest	486.18	0.37
Land with no vegetation	569.54	0.44
Urban area	270.23	0.21
Water	10,033.93	7.77
Total	**130,374.9**	**100.0**

Table II: **ESTIMATED TYPE OF FOREST COVER FOR THE YEAR 2000**

Actual land use	Área(Km2)	Porcentage %
Open Broad leave Forest	19,401.53	14.88
Closed Broad leave Forest	31,683.44	24.30
Open Conifer Forest	3,950.15	3.03
Closed Conifer Forest	1,160.21	0.90
Forest fallow	4,836.20	3.73
Mangrove	690.47	0.53
Palm forest	486.18	0.37
Total	**62,208.2**	**47.7**

END

D. Papua New Guinea[1]

Introduction

Papua New Guinea (PNG) occupies the eastern half of the Island of New Guinea with a total land area of 452,8600km^2; sharing a common border with the Indonesian Province of West Papua (formerly, Irian Jaya) to the west, Australia to the south, the Solomon Islands to the east and the Federated States of Micronesia to the north. It is surrounding by 600 islands of which the four largest ones are New Britain, New Ireland, Manus and Bougainville, with a population of 5.2 million. The country is rich in natural resources such as forests, minerals, gas and oil. It also has considerable biological diversity, estimated at between 5-7% of the world within an area of less than 0.1% of the global land mass.

The intact natural forests cover 65% (29.437 million ha) of the country with a further 10% (4.474 million ha) comprising other wooded lands.

PNG also has an area of 2.4 million km^2 Exclusive Economic Zone encompassing some 17,000km^2 of coastline, almost 2000 coastal villages, with a population of well over 500,000 people.

Ninety-seven percent (97%) of all the land is customarily owned by various clans, which speak well over 800 different languages.

1. Impacts of Climate Change

The impacts of climate change has already being experienced in the country for the past thirty years, especially in regard to the following:

a) Temperature and Rainfall

i. Both temperature and precipitation trends resemble the global and regional trends respectively. Longer periods of wet season have been experienced throughout the country over the past five years, with some areas experiencing an almost wet years with no marked dry periods. This has resulted in large areas in the highlands and on low lands which have been denuded somewhat to have frequent landslips causing deaths and massive floodings;

ii. The increase in the mean near surface temperatures has been greater than that of the mean maximum temperatures since 1970, an average increase of 0.5^{o}C and a range of between 0.5 – 2^{o}C has been experienced over the past 5-10 years;

b. Climate/Weather Change

i. The detection of climate change is still uncertain as it is based on the current data sets, which have a short period of observations;

ii. The dry seasonal patterns exhibit weakening La Nina impacts during the dry season and that of the weakening is eventually being converted into weak dry conditions – implying longer decadal phases of dry conditions;

[1] FCCC/SBSTA/2006/MISC.5, pages 57 to 59

iii) There is an obvious need for a widespread climate network to effectively monitor climatic variables unique to this part of the world. This may include the careful observation of the northwest monsoonal flows necessary for the detection of the onset of the El Nino episodes;

c. Sea Level Rise

There is already a relative sea level rise around the country, but this is strongly influenced by El Nino and La Nina signals. Nevertheless, in some low lying coastal areas as well as around small atoll and volcanic islands evidence of sea level rise are quite obvious. Examples of submergence and erosion presumably due to sea level rise could be observed on the Cartarets Islands, northeast of Bougainville and in the Duke of York Islands of East New Britain province, and along most of the coastlines of both the main land and major islands. In addition, over the past few years incidences of frequent occurrence of sea surges have increased both in terms of frequency and intensity such that last year a number of coastal communities (400 in Western Province) have to be relocated due to their villages being destroyed by the sea surges.

2. Data and Drivers for deforestation

The natural forests cover about 65% or 29.437 million ha of the total land area, while another 4.447 million ha comprise other forms of wooded lands. From 1990 to 2005 a total of 2.086 million ha of forest have been deforested, with a rate of 4.54% pa. The drivers of deforestation in the country are basically related to increasing population growth, which is currently estimated at 3.7% per year and the desire of the government for economic. The major drivers of deforestation in the country are forest logging, large-scale commercial agriculture, subsistence agriculture (slash and burn), urban expansion, infrastructure development (e.g., roads, airstrips, etc), mining, gas and oil exploration and extraction. Presented below are the annual estimates of areas deforested by these major drivers of deforestation:

Drivers of deforestation	Average Area (ha)pa
Logging	139,050
Agriculture (Commercial)	70,000
(Shifting Cultivation)	260,000
Infrastructure	30,000
Urban Expansion	67,000
Mining	150,000
Oil and gas Exploration/Exploitation	50,000

3. Experiences

Over the past 10-15 years the government has been trying its utmost to reduce unnecessary and illegal deforestation activities, especially in areas of logging. Such that following its Royal Commission into forest activities in the late 1980s, the government an acted a new Forestry Act in 1991 that created an Authority – the PNG National Forest Authority. In addition to the Act there is also the Policy (1991) and the National Forest Development Guidelines (1993), all of which are aimed at regulating the management and utilization of the natural forests of the country. Another important initiative was the development of a National Forest Plan (1996). This plan comprises the forest development plans from all the 18 provinces of the country. Further, two addition policies have been developed and are awaiting the approval from the National executive Council (NEC). These are the Eco-Forestry and Reforestation Policies.

The adoption of the acquisition of customary forest resources through the concept of Forest Management Agreement (FMA) under this new Act is directed towards sustainable forest management through selective logging using a 35-year cutting cycle. Under the FMA clear felling of natural forests is not permitted. Furthermore, the adoption of the PNG Logging Code of Practice is among other measures taken by the government to minimize impacts on the environment.

The Environment Act 2000 ("the Act") enacted in the National Parliament of Papua New Guinea also reiterates the government's commitment to properly manage and develop the country's natural resources, including the forests. This new Environment Act comprises an amalgamation of three legislations including the *Environment Planning Act (1978),* the *Environment Contaminants Act (1978)* and the *Water Resources Act (1982*) building on new approaches in environment protection and management.

Pertinent features of the Act include a three-tiered process in environmental permitting based on the nature of environmental harm that may be caused by a proposed activity. Those activities that have the potential to cause serious environmental harm (Prescribed Level 3 Activities) are subjected to a more rigorous process involving the need to undertake an environment impact assessment (EIA) and preparation of an environment impact statement, which is reviewed and a recommendation made by the Environment Council on the proposal. Other more minor proposals (Prescribed Level 2 activities) a dealt with under the normal environment permitting process with the Director of Environment making the final decision to issue an environment permit.

A large improvement from previous environment legislation and an important feature of the Act are the high penalty fines and stage enforcement procedures. The Act also provides for Provincial Environment Policies to be developed. These policies however need to be consistent with national environment protection and management policies, which can be made for a whole range of matters or for the policy to cover a defined geographical area to protect a defined beneficial value.

In regard conservation and protection efforts, the government has to date demarcated about 1 million ha of forests for such purposes and is aiming to further increase the extent of protected areas to at least 20% of the land. However, the government is faced with a number of problems to further its aim of increasing the acreage of protected areas as well as taking control of forest management and development due to the fact that it does not own the resources and also there so many opportunity costs involved in acquiring the resources for any type of development that the government planned to implement.

Thus the government of PNG fully supports the development of a market of carbon trading under this reduce emissions from deforestation in developing countries, not only to assist its development approaches, but also to further enhance its environment protection and conservation efforts and the livelihoods of its rural population.

END

E. Malaysia[1]

Background; Malaysia's Forest Policy and Sustainable Management Protocol

The forestry sector is one of the important economic sectors in Malaysia. Malaysia also recognises the immense importance of the forest resource in providing environmental protection, particularly those related to climate change. In this regard the issue of deforestation being addressed under the United Nations Framework Convention on Climate Change (UNFCCC) is a relevant and important issue for Malaysia.

Malaysia has stated in previous submissions that the primary priority in the fight against climate change should be the reduction of emissions at source and that sinks should play only a transitional role and thus, be included as an activity for the short term. We continue to emphasise the greater importance of sustainable management of existing sinks and reservoirs, this being amongst the commitments of the UNFCCC, while Land Use, Land Use Change and Forestry (LULUCF) activities should promote the long-term sustainable management of forests and their resources.

Malaysia has an extensive forest resource, with natural forest land cover approaching 60 percent. Malaysia remains committed to manage her forests sustainably. Forest management objectives are clearly specified in the National Forestry Policy. The conservation of forests and their resources is also in tandem with the commitments outlined in the Convention on Biological Diversity, which Malaysia ratified in 1994. Malaysia's forests can be categorised according to the degree of protection and land use classification. Management of forested land falls under three broad categories:

i. Totally protected areas (Wildlife sanctuaries, National and State Parks, numbering in excess of 50);
ii. Permanent Reserved Forests (PRFs), which comprise over 75% of the natural forests in Malaysia, and include both protection and production forests, to be maintained and managed sustainably, and
iii. Stateland (conversion) forests which are land reserved for future development purposes.

Malaysia's 'best practices' approach to forest management has been able to conserve the biological resources and carbon stocks by avoiding the deforestation cycle. Unlike the situation in many developing countries, where harvesting is followed by burning and a gradual conversion to agricultural or grazing land, Malaysian forests under the PRFs do not undergo a change in land use. This is illustrated by the fact that the area of Malaysian forest under the PRFs has not changed substantially in the last 10 years. However, deforestation activities do occur and are confined to Stateland and alienated forests. This is because these areas have been long earmarked for development and represent the respective State land banks. Based on these practices, Malaysia has had limited opportunities for Afforestation and Reforestation (A&R) activities under the CDM.

[1] FCCC/SBSTA/2006/MISC.5, page 93

F. Panama on behalf of Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama[1]

The Central American Context

In an attempt to fight environmental degradation and implement more sustainable land use, the Central American Forestry Strategy (EFCA) was approved during the XXXIV Ministerial Meeting of the Central American Commission on the Environment and Development (CCAD), of October, 2002. The EFCA hopes to curb the deforestation process in the region by having all Central American countries reviewing or updating their forest policies and National Forest Development Programs.

The EFCA mission is to become a permanent forum for discussions and action pertaining to sustainable forestry development in Central America. Its strategic objectives are (i) to support the implementation of the principles, actions and agreements of the Forum and Intergovernmental Forest Panel (IPF/IFF) and (ii) to position the forestry sector as an important agent of economic, social and environmental development contributing to vulnerability reduction and poverty alleviation.

The goals of EFCA are: (i) Strengthen the forest agenda in Central America, (ii) Increase forest coverage in the region, (iii) Restore degraded forests, (iv) Strengthen the Central American System of Protected Areas (CAPAS) and, (v) Promote the competitivity of the Central American forest sector.

Within this context, the Ministerial Council of the CCAD, has approved three regional programs framed within the initiative of the Mesoamerican Biological Corridor: (a) PERTAP – Regional Program of Work in Protected Areas, (b) PERCON – Regional Program for Connectivity and (c) PROMEBIO – Regional Program for Monitoring and Evaluating Biodiversity.

V. Information and exchange of experiences on matters of policies

In Central America, a wealth of experience has been acquired from natural protected areas and is worth sharing with other signatory countries of UNFCCC. Table 1 presents a summary of the information on deforestation figures for 2005 together with an overview of effective conservation measures that have been adopted by different countries to reduce deforestation. Reference to the Mesoamerican Biological Corridor is abbreviated a CBM.

[1] FCCC/SBSTA/2006/MISC.5, pages 103 to 104 and 108 to 109

Table 1

Relevant information/issues	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama	Regional Total
Total area (km^2)	22,966	50,100	21,040	108,798	112,492	130,642	75,516	521,554
Forest covered area 2005 (km^2) % of national total	17,210 69%	21,310 46%	20,20 9.6%	40,406 37.2%	54,000 48%	54,840 24%	33,640 45%	223,426 42.8%
Current gross deforestation (h yr^{-1}) % of national total	36,000 1.5%	8000 0.16%	4000 0.19%	53,700 0.49%	90,000 0.80%	150,000 1.15%	47,158 0.62%	388,858
% national territory under natural protected area systems	47.2%	25.2%	0.33%	29.4%	19.7%	17.0%	26.0%	25%
Modalities resulting in avoided deforestation								
Protected areas and nature reserves (public, private, indigenous peoples)	Rio Bravo	Central Volcanic Mountain Range Conservation Area	40 natural areas under co-management regime	Cuchumatan Communal Forests	37 Cloud forests, legally protected	69 protected areas and 43 Private reserves	Darien National Park	
Areas under forest management	a) Columbia River b) Chiquibul	a) CODEFORSA b) FUNDECOR		Community forest awards				
Payment for environmental services		Voluntary agreements with private enterprises						
Biosphere reserves				a) Sierra las Minas b) Maya	Río Platano	Bosawas Reserva de la Biosfera del Sureste de Nicaragua	International Park La Amistad	
Biological Corridors		Talamanca-Caribbean	El Trifinio	El Trifinio	a) El Trifinio b) CBM	Corredor Biologico del Atlantico (Río San Juan)	Panamanian Atlantic Biological Corridor	

Source: Rodríguez, J.E., 2005. "Centroamérica en el Límite Forestal: Desafíos para la Implementación de Políticas Forestales en el Istmo" CCAD/EFCA/PROARCA/UICN

G. United States of America[1]

U.S. actions to slow deforestation in developing countries

The United States has made a significant and sustained commitment to helping tropical countries conserve and protect their forest resources. U.S. approaches to addressing tropical deforestation target the root causes of deforestation unique to each locality. The economic, political, and social drivers of deforestation at a particular site must be analyzed in order to tailor responses according the threats faced in that particular environment.

Depending on the local context, action to reduce deforestation could include one or more of the following approaches: 1) Increased financing for sustainable forest management and protection (e.g. Tropical Forest Conservation Act, described below); 2) Harnessing of market forces to increase market opportunities for sustainably and legally- produced timber products; 3) Increasing the area under effective protected area management; 4) Strengthening forest institutions to implement and enforce forest management and protection policies and plans; 5) Transferring technologies, such as remote sensing, for improved forest cover assessment and monitoring; 6) Identifying and promoting alternative sustainable livelihoods near protected forests; 7) Strengthening civil society and increasing public awareness and participation; 8) Clarifying land use and property rights; and 9) Devolving authority in forest governance to the local level.

Below are some specific cases where one or more of these approaches has been successful in reducing rates of deforestation. Although this is not an exhaustive survey of the tropical forest conservation programs supported by the U.S., it is illustrative of the breadth and depth of U.S.-supported programs to address tropical deforestation:

The Tropical Forest Conservation Act

The Tropical Forest Conservation Act (TFCA) offers eligible developing countries options to relieve certain official debt owed the U.S. Government while at the same time generating funds in local currency to support tropical forest conservation activities. In addition to forest conservation and debt relief, TFCA is intended to strengthen civil society by creating local foundations to support small grants to NGOs and local communities. The program also offers a unique opportunity for public-private partnerships and many TFCA agreements to date have included funds raised by U.S.-based NGOs.

Recognizing the diverse set of environmental benefits provided by tropical forests, as well as critical social and economic dependencies of regional economies and local communities on these forests, TFCA provides for funding of a wide range of activities so that conservation efforts can be tailored to regional and local circumstances. These include:

• Establishment, restoration, protection and maintenance of parks, protected areas, and reserves.
• Development and implementation of scientifically sound systems of natural resource management, including land and ecosystem management practices.
• Training programs to increase the scientific, technical, and managerial capacities of individuals and organizations involved in conservation efforts.
• Restoration, protection, or sustainable use of diverse animal and plant species.
• Research and identification of medicinal uses of tropical forest plant life to treat human diseases, illnesses, and health related concerns.

[1] FCCC/SBSTA/2006/MISC.5, pages 118 to 122

• Development and support of the livelihoods of individuals living in or near a tropical forest in a manner consistent with protecting such tropical forest.

TFCA is implemented through bilateral agreements. Under the program, by the end of 2005, $56 million of appropriated funds had been used for nine debt reduction/debt swap agreements with Bangladesh, Belize, El Salvador, Peru, the Philippines, Panama (2 agreements), Colombia and Jamaica. Through these agreements, over $97.3 million in forest conservation funds will be generated in these countries over 10-26 years.

Bangladesh. Of Bangladesh's 14.76 million hectare land base, 2.2 million hectares remain in forest. Signed September 12, 2000, this agreement saves Bangladesh $10 million in hard currency payments and will generate $8.5 million in local currency payments for forest conservation. Under the agreement, the Arannayk Foundation uses these funds to achieve forest conservation through partnerships with local stakeholders aiming at capacity building and developing alternative income sources for people living in vicinity of the forests.
Belize. Concluded in August 2001, this agreement combines $5.5 million in appropriated funds with $1.3 million in private funds raised by The Nature Conservancy to reduce Belize's official debt to the U.S. by half. Under the agreement, the Government of Belize issued new obligations that will generate approximately $9 million in local currency payments to help a consortium of four local non-governmental organizations administer conservation activities.
El Salvador. Signed in July 2001, this agreement reduced El Salvador's official debt to the U.S. by $3 million. Over the life of the agreement, it will generate $14.3 million in local currency payments for forest conservation activities. Initial conservation efforts will target reforestation of hillsides.

Peru. Signed in June 2002, this agreement combines $5.5 million from the U.S. Government, and $1.1 million from The Nature Conservancy, Conservation International and the World Wildlife Fund to cancel a portion of Peru's debt to the United States. Peru will issue local-currency obligations that will generate payments for conservation totaling $10.6 million over the next 12 years. The payments will fund forest conservation activities through local NGOs. The agreement designates ten protected forested areas within Peru's National System of Protected Areas as priority conservation areas. Together these areas cover more than 27.5 million acres within the Peruvian Amazon.

Philippines. Concluded in September 2002, this debt reduction agreement will generate $8 million for small grants for forest conservation activities over 14 years. While the funds may be used for a variety of protection and management purposes, the agreement identifies conservation of coastal forests, especially mangroves, as a priority.

Panama. Two debt-for-nature swaps have been concluded with Panama under the TFCA. An agreement signed in July 2003, combined $5.6 million from the U.S. Government with $1.2 million from The Nature Conservancy to generate $10 million to improve management of the Upper Chagres River Basin in the Panama Canal Watershed. The watershed provides 50% of the water needed to operate the Panama Canal and 80% of the water needed for human consumption in the region. The second agreement, concluded in August 2004, combined $6.5 million from the U.S. Government with $1.3 million from The Nature Conservancy to generate $11 million over 12 years to help conserve 1.4 million acres (579,000 hectares) of the exceptionally rich forests of the Darien National Park bordering Colombia. The park forms a unique land bridge between North and South America and is home to such rare species as jaguar, harpy eagle, wild dog and tapir.

Colombia. Announced in April 2004, this debt-for-nature swap combines $7 million from the U.S. Government with $1.4 million from The Nature Conservancy, Conservation International and the World Wildlife Fund. The agreement is expected to generate $10 million over 12 years for conservation

activities throughout Columbia's system of protected tropical forests. Specific areas of focus include improving protection for areas that buffer protected forests, enhancing corridors between protected areas, and establishing an endowment to fund conservation activities in protected areas.

Jamaica. Concluded in September 2004, this debt-for-nature swap combines $6.5 million from the U.S. Government and $1.3 million from The Nature Conservancy to generate $16 million over 20 years for tropical forest conservation. There are seven priority sites for the funds including the Blue and John Crow mountains National Park in the East and the Negril Protected Area in the West.

President's Initiative Against Illegal Logging

Launched in July 2003 and led by the Department of State, President Bush's Initiative Against Illegal Logging assists developing countries in their efforts to combat illegal logging, including the sale and export of illegally harvested timber, and in fighting corruption in the forest sector. The Initiative focuses on identifying and reducing threats to protected forest areas and other high value conservation forests from illegal logging through four key strategies:

• Good Governance - Building national capacities to establish and strengthen legal regimes and enforcement of laws affecting forest management, especially those aimed at illegal logging;
• Community-Based Actions - Enhancing community involvement in forest governance and related wildlife issues;
• Technology Transfer - Developing integrated monitoring systems and building in-country capacity to monitor forest activity and compliance with laws; and
• Harnessing Market Forces - Promoting good business practices, transparent markets and legal trade, including in-country capacity to implement obligations under CITES.

Viewed collectively, the actions being undertaken under the President's Initiative Against Illegal Logging represent the most comprehensive strategy being implemented by any nation to address this critical sustainable development challenge. In 2003, 2004 and 2005, U.S. Government funding for Initiative activities were, respectively, $15 million, $17 million, and $15 million. Supported activities focused on three critical tropical forest regions: the Congo Basin, Amazon Basin and Central America, and South and Southeast Asia.

In the Congo Basin, Initiative activities include integrating remote sensing and ground-based monitoring of forests, enhancing training and capacity building for forest monitoring and law enforcement (including protection of wildlife), introducing reduced impact-logging techniques, and co-sponsoring an Africa-wide Forest Law and Governance Ministerial Conference.

In the Amazon Basin and Central America, Initiative activities include supporting compliance with the new CITES Appendix II listing of big-leaf mahogany, assessing and testing of forest monitoring technologies, providing technical assistance and training, supporting sustainable forest management and market based incentives for trade in legal and sustainable forest products, strengthening protected area management, capacity building for legal logging operators, and promoting actions on forest law enforcement and governance.
In South and Southeast Asia, Initiative activities include promoting community-based forest management and protection, addressing illegal logging threatening orangutan habitat, and on follow-up actions related to the East Asia Ministerial Conference on Forest Law Enforcement and Governance held in Bali in 2001.

U.S. Agency for International Development (USAID) Forest Protection Programs

USAID programs help countries conserve and protect their forest resources and at the same time protect livelihoods of local communities and biodiversity conservation. These programs include The Global Conservation Program, the Sustainable Forest Products Global Alliance, Parks in Peril, and the Alternatives to Slash and Burn Program in Madagascar.

The Global Conservation Program (GCP) is a partnership with six U.S.-based conservation organizations: African Wildlife Foundation (AWF), Conservation International, Enterprise Works Worldwide, The Nature Conservancy, Wildlife Conservation Society, and World Wildlife Fund. The GCP has worked in over fifteen countries to help place more than 33 million hectares under improved management (1.8 million hectares since 2003). More than half of this area consists of tropical forests, roughly 40 percent grasslands and woodlands, and less than 10 percent coastal and marine areas.

Parks in Peril (PiP) has worked since 1990 to improve the protection of 45 critically threatened national parks and reserves in Latin America and the Caribbean. The Parks in Peril program strategy has been to strengthen partner organizations and build sustainable capacity to achieve enduring site conservation results. Protected areas were strengthened through USAID contributions to the Parks in Peril program in the Bolivia, Peru, Dominican Republic, Ecuador, Guatemala, Jamaica, Panama, and Peru.

The Sustainable Forest Products Global Alliance (SFPGA) is a public/private partnership that seeks to make markets work for forests and people by catalyzing businesses, public agencies, and non-governmental organizations to encourage the responsible management of forest resources, reduce illegal logging, and improve the well-being of communities. By promoting sustainable forest management, and reducing trade in illegally harvested or unsustainably managed forest products, opportunities for forest-dependent communities and low-income producers grow. By increasing the supply and demand of legally produced products from well-managed forests, this program promotes greater forest conservation, leading to increased carbon sequestration, due to reductions in forest conversion and unsustainable logging practices. In 2005, the Sustainable Forest Products Global Alliance grew to 373 trade participants (processors, manufacturers, traders, or end-users of wood or paper products) and 35 forest participants (forest owners or managers) that together sustainably manage 13.3 million hectares.

Alternatives to Slash and Burn Agriculture in Madagascar: A key element to reducing slash and burn agriculture is providing alternatives that transform rural natural resource use into diversified, sustainable, productive, and profitable agro-ecological farming systems. This has been accomplished by interventions at all levels – national, regional, and local – and at all stages – production, marketing, transformation, export, and policymaking. As a result of this intervention, over 30,000 households are producing litchis for commercial export, and over 15,000 households have adopted new agricultural techniques within a farming systems approach, which has resulted in a 55% increase in income. In addition, 21,289 hectares of natural resources have been transferred to communities for local management, which has empowered local people to make decisions that directly impact the future use and conservation of the resources on which they depend. Twelve communes in priority zones for conservation earned a “green commune” designation by implementing activities to reduce slash and burn practices and promote sustainable management of natural resources.

- - - - -