REDUCING EMISSIONS FROM DEFORESTATION IN DEVELOPING COUNTRIES (REDD)
Submitted by: Indonesia

A. INTRODUCTION

Forest resources in many developing countries play important roles in national economic development as well as source of income and other customary uses for local people. In the context of global climate change, **deforestation and forest degradation in developing countries** contributes significantly to global CO2 emission. Significant emission reduction could be made, however, if appropriate compensation mechanisms can be created.

Indonesia is a country with forest land about 60 % of the country area. Our forest is important not only for national economy development and livelihood of local people, but also for global environment. Indonesia is the home of mega diversity and one of the custodians of the world tropical peat land. Peatland alone, recorded as the highest carbon storage as well as source of emission, covers about 10 percent of the country area, and plays important role not only for environment, but also economic and social functions.

Indonesia put a high interest on the issue of REDD as we are currently facing the challenge of deforestation and forest degradation which could contribute to global CO2 emission. On the other side, effort on sustainable forest management, rehabilitation of degraded forest and non-forest land, and protected area management could contribute positively in reducing global emission and restoration of other global environmental function.

B. SCOPE OF SUBMISSION

Draft Conclusions proposed by Chair in the **Twenty-fifth session of Subsidiary Body For Scientific And Technological Advice in Nairobi, 6–14 November 2006 on Agenda item 5 Reducing emissions from deforestation in developing countries, contained in** FCCC/SBSTA/2006/L.25 13 November 200 stated that :

Paragraph 4. The SBSTA decided to continue discussing range of topics considered at the first workshop, including the submissions referred to in paragraph 5, and at the second workshop that will focus on: the discussions of ongoing and potential policy approaches and positive incentives, and technical and methodological requirements related to their implementation; assessment of results and their reliability; and improving the understanding of reducing emissions from deforestation in developing countries.

Paragraph 5. SBSTA invited Parties and accredited observers to submit to the secretariat, by 23 February 2007, their views on the topics referred to in

paragraph 4 above. The SBSTA requested the secretariat to make available this information for discussion at the workshop and to compile this information for consideration by the SBSTA at its twenty sixth session.

Paragraph 6. The SBSTA invited Parties, in their submissions to consider relevant provisions of other conventions, including the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) and also the work of multilateral organizations, including the United Nations Forum on Forests, the International Tropical Timber Organization, and the World Trade Organization.

Paragraph 7. The SBSTA invited Parties not included in Annex I to submit to the secretariat, by 23 February 2007, any updated information and data additional to that provided in their latest national communications and synthesized in the background paper prepared for the first workshop, on emissions and trends in deforestation, data needs, and policies and programmes in place or being considered to address deforestation and its root causes. The SBSTA requested the secretariat to compile and make available the information at the second workshop, and to provide a short presentation at the workshop.

C. ISSUES AND INDONESIAN VIEWS

1. Ongoing and Potential Policy Approaches and Positive Incentives

a. Policy Approaches

Deforestation in developing countries especially in the tropics was recorded to contribute approximately 20 % of the global carbon emissions. The drivers are varies among countries but in most cases are economic background. The rationale behind deforestation is obvious i.e unique role of forest in climate stabilization and as live support system have not adequately been recognized neither under current climate related mechanism nor under existing market system for forest products and services.

Based on Stern Review, total CO_2 stored in earth vegetation and soils approximately 7500 Gton, larger than what is in oil stocks and more than twice amount accumulated in the atmosphere. The fact that forest resource plays important roles in national development of many developing countries and resource where many local people depend for their source of income, to reduce emissions from deforestation in developing countries need appropriate policy approaches that would not jeopardize their economic development and local people livelihood while

maintaining the interest of global community as well as future generation.

Reducing emissions from deforestation in developing countries requires contribution from international communities, taking into account the following guiding principles : common but differentiated responsibilities, real benefits for the climate and integrity with other international regimes related to forestry, sovereign rights of the country where the forest located, and sustainable development objectives.

Policy approaches on reducing emission from deforestation in developing countries must be broad enough to ensure that the approaches could best fit different national circumstances. National circumstances of developing countries are diverse and policy/programmes/activities that contribute towards global efforts in reducing emission from LULUCF sector are also varies. In this basis, country may consider various initiatives and schemes for example : promotion of Payment for Environmental Services (PES), Sustainable Forest Management (SFM), Protected Area management, community based forest management, combating illegal logging, forest fire management, and rehabilitation of degraded lands, as part of the whole efforts that contribute to reducing emission from LULUCF sector.

b. Positive Incentives

International climate regimes available for forestry sector are limited to A/R CDM and non-market approaches such as through SCCF, adaptation fund, and ODA.

b.1. A/R CDM

CDM was believed as a win-win mechanism between Annex I and non-Annex I countries in the effort of stabilization of GHGs concentration in the atmosphere and supporting sustainable development in developing countries (non-Annex I). Unfortunately, the existing CDM projects concentrate only in few countries. Furthermore, despite the recognition that CDM in forestry bring a number of ancillary benefits, very few A/R CDM have been implemented. Indonesia, is one among countries with very few CDM projects, up to now there has not been forestry project implemented in Indonesia despite the readiness of the country in terms of institutional and regulatory as well as scientific, technical and methodological aspects. One major reason is difficulties in finding eligible land which meet the definitions of forest, afforestation, and reforestation used for CDM-forestry. Furthermore, the fact that CDM rules and procedures are not simple have reduced the interest of

project proponents towards CDM-forestry and investing in other forestry projects/activities may be more profitable than in CDM projects. One of the advantages for non LULUCF CDM is preference of the buyers/potential investors towards energy sector compared to CDM forestry.

b.2. REDD mechanism

REDD mechanism is one that could complement A/R CDM. Based on Stern Review, emission from deforestation is expected to reach 40 Gt CO_2 between 2008-2012, increasing about 2ppm CO_2 at the atmospheric level if no prompt action is taken. However, cutting deforestation in developing countries may be done relatively rapidly without requiring development of new technology if challenges associated with it can be tackled especially drivers of deforestation. Deforestation drivers are dynamic and sensitive to global market development. For this reason, efforts by developing countries need to be backed by international communities, especially industrialized countries, where they have reached certain level of national economic development and receive benefits from voluntary actions by developing countries. Depending on the readiness of each country, the REDD mechanism should open for both market and non-market options.

b.3. Forest Climate Related Mechanism (FCRM)

This mechanism is to account for any other efforts that reduce emission from LULUCF or enhance carbon stocks from LULUCF that are not eligible for A/R CDM and REDD mechanisms. This mechanism is to refer to the principle that the new mechanism should best fit different national circumstances including the drivers of deforestation as well as policy/programmes/activities taken to tackle the problem of deforestation.

Some countries may not gain benefit from both A/R CDM and REDD mechanisms, on the other hand their efforts clearly contribute to reversing emissions from LULUCF sector, hence on the stabilization of GHGs in the atmosphere, for example, by creating new forests, enhancing soil capacity to store carbon, and other sustainable practices. The FCRM is proposed to accommodate activities recognized in forestry terms such as SFM (both natural and man made forests), Environmental Services, and rehabilitation of degraded lands through (non-CDM) afforestation and reforestation.

2. Technical and methodological requirements related to their implementation, Assessment of results and their reliability

Despite some technical difficulties in measuring accurately the contribution of tropical deforestation to carbon-dioxide emission, and hence to global warming, estimates are readily available. Techniques and methods currently available may be used to measure reduction of GHGs emission from deforestation in developing countries with sufficient degree of accuracy. Existing tools on remote sensing and forest inventories may be used to estimate forest area changes, forest stratification, and allometry to estimate carbon stocks. The combination between the two will produce estimated emission from deforestation. National Communications, National Report for forest related international agreements or forum, IPCC Guidelines relevant to forests, assessment of emission reduction factors and review procedures provide a system for data quality assurance. The methodologies allow developing countries to voluntarily participate in this global effort according to their national circumstances.

Remotely sensed forest cover and its changes combined with robust verification and ground check of forest types and associated carbon stocks are the most feasible techniques to monitor emission from deforestation in Indonesia, since there are many variety of methods applicable, varying to many circumstances such as MODIS, which meet cost constraints and high accuracy for forests diversity and characteristics.

a. Baseline and Leakage

   Estimates of deforestation rate in Indonesia vary considerably. Forestry Statistics of Indonesia published by the Ministry of Forestry, quotes a constant figure, which can be used to model historical and projection rate of deforestation in Indonesia for business as usual case. Concept of setting a cap can be done by estimating emission reduction target (Figure 1).. Change in forest area and the associated carbon stocks monitored with acceptable degree of accuracy will be compared with the target to calculate emissions reduction due to deforestation.

b. Monitoring and Verification

   Wherever available, wall to wall mapping of forest cover change could be carried out using moderate low cost spatial resolution sensors. Ground check involving local community can be carried out at a regular basis.

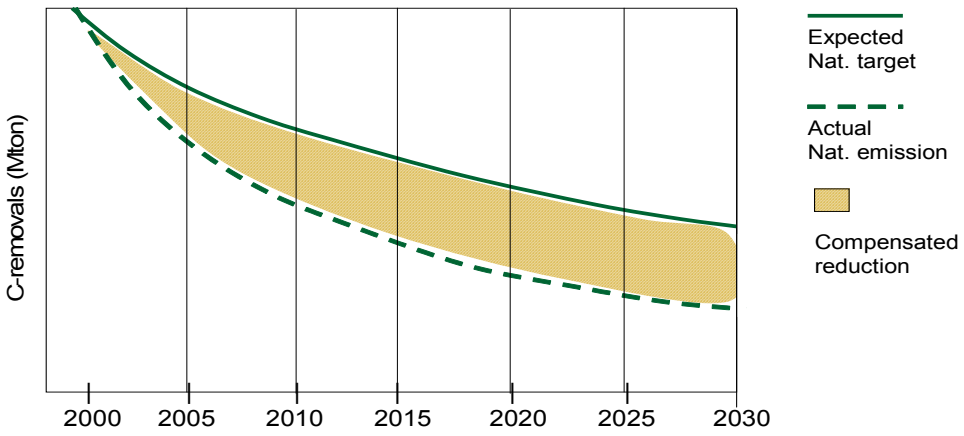

Figure 1. Hypothetical Indonesia's Potential of C-Removal from REDD

D. PROPOSED METHOD

Below is a proposal on a simple approach how developing nations can create a cash flow which allow them to protect their forest resources.

1. Definition of Deforestation

   Definition of deforestation varies from one country to other countries. Adoption of one definition for deforestation is essential to ensure the fairness of providing incentive for developing nations. In the context of Kyoto Protocol deforestation is defined as a direct human induced conversion of forested land to non-forested land. In many developing countries most of forests have been exposed to intensive logging and repeated fires, these forests may change into grassland or critical lands. Considering this condition, incentive mechanisms should also be provided to parties who can recover the carbon stock in degraded forests. In this regards, Government of Indonesia proposes an alternative definition for deforestation. The deforestation should refers to the loss of forest due to human activities which include conversion of forest to other uses that have lower carbon stocks, and loss of forest due to continuous degradation resulted from repeated fires, and illegal logging. As the consequence of adopting this definition, voluntary actions done by developing countries which include (i) enrichment planting in secondary forests, (ii) targeted emission reduction through avoid conversion of forest to other land uses that have lower carbon

stock, (iii) targeted emission reduction through combating illegal logging and fires, and (iv) conserving carbon through forest conservation, should be eligible for the compensation.

2. Approach for Determining the Amount of Compensation/Incentive

   Referring to the above deforestation definition, the ultimate objective of any mechanism defined to avoid further deforestation is the protection and conservation of carbon pools as well as improvement of carbon pools in degraded forests relative to the baseline condition. The amount of the compensation will be determined based on the ability of participating country in maintaining the forest area not less than reference case (RC) and ability in increasing carbon stock in the forest areas above the reference case (RC).

   The reference case for the forest area should be developed on country basis considering the population density. Many studies indicate that population density is strongly correlated with deforestation rate, with the correlation increasing with the number of rural landless families (Ludeke et al. 1990; Reis and Margulis (op. cit.), 1991; Adger and Brown 1994; Harrington 1996; Sisk et al. 1994; Kaimowitz 1997; Ochoa-Gaona and Gonzales-Espinosa 2000). The relationship between population density and percentage of forest cover in tropical Asian countries has been established by Matsuoka *et al.* (1994) (see Figure 2). The relationship between forest fraction and population density for Indonesia has been updated by Murdiyarso *et al.* (2005; see Figure 3).

   In this approach, a country interested in participating in the mechanism should define officially the forest fraction under the RC based on the population density along with information on percentage of disturbed (secondary forests) and undisturbed forest area (pristine forest) at national or sub-national level. Process and methodology for developing the relationship between population density and forest fraction should use a transparent, consistent and scientifically-based method. To claim the credit, the country should then define targeted forest areas to be included in the mechanism. Different carbon counting system will apply for disturbed and undisturbed forests. The following paragraphs discuss the claimant process under disturbed and undisturbed forests.

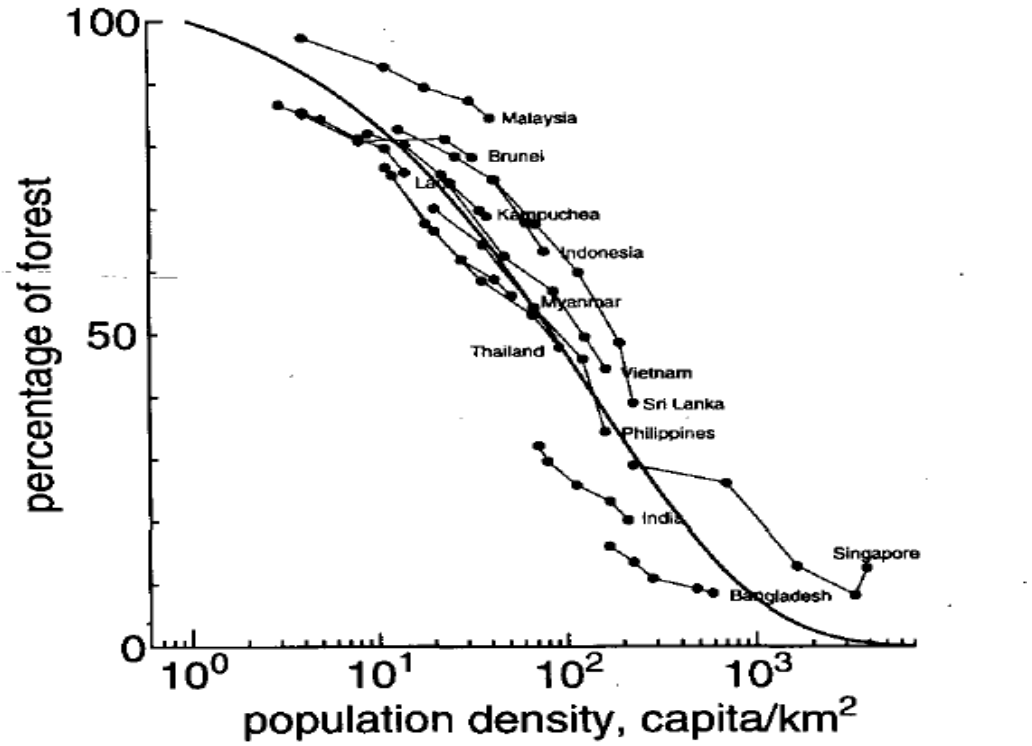

Figure 2. Relationship between percentage of forest area and population density in tropical Asian countries (Matsuoka et al., 1994)

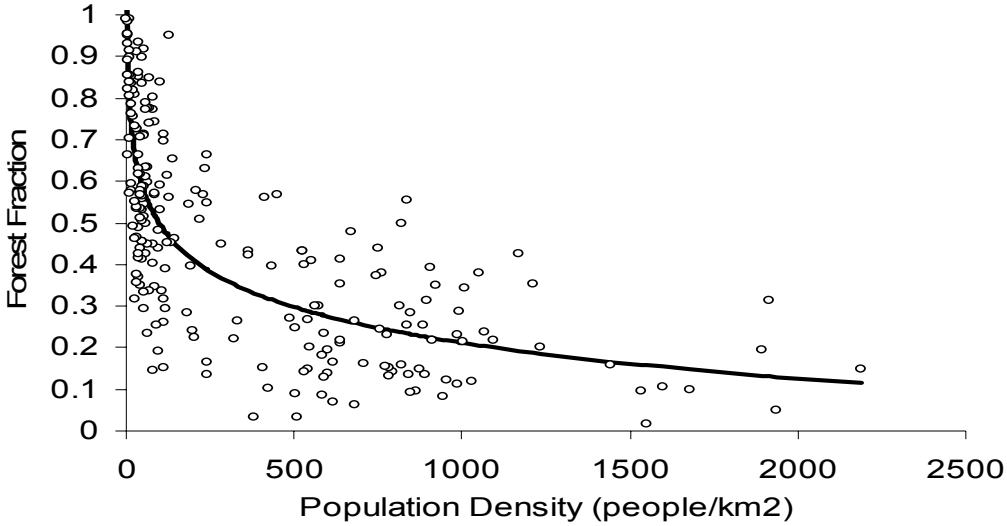

Figure 3. Relationship between Population Density and Paddy Rice Fraction/Forest Fraction in Indonesia (Murdiyarso *et al.*, 2005)

a. Undisturbed Forests (Pristine Forests where no significant carbon stock may occur)

The total credit that can be claimed by country who has defined the targeted areas for the mechanisms is total area of the targeted protected forests multiplied by the carbon stock per unit area. Suppose the total targeted areas are 1000000 ha located in 10 districts and average carbon stock is 600 ton CO_2e/ha, the total credit would be 600,000,000 ton CO_2e. If the agreed price of per ton CO_2 is 5 USD, then the country would be eligible to get total amount of compensation as much as 3 billion USD. The country could decide to sell the carbon credit on annual basis or for certain periodical basis. The country can get the full amount of compensation as long as the forest can be maintained (no deforestation occurs) and there are no decrease in forest fractions in the administrative areas where the targeted areas are located. With this approach the problem of leakage is addressed. The distribution of the compensation among districts can be decided internally by the country.

b. Disturbed Forest (Secondary Forest)

In this system, the total credit that can be claimed by country may change overtime as the carbon stock may increase as the forests growing. The minimum credit that can be claimed by the country would be the total area of the targeted forests multiplied by the carbon standing stock per unit area at the time of the project start. Additional compensation can be obtained if the carbon stock in the targeted forests increased from the level at the time of the project start.

In summary, the approach to determine compensation for avoiding deforestation will follow five steps:

Step 1: The eligible countries should define the forest fraction under RC based on population density

Step 2: Proportion between disturbed and undisturbed forests in each administrative area of the countries should be reported and documented using a transparent, consistent and scientifically-based method

Step 3: Delineation of forest areas under threat or at risk going to be targeted for the mechanism in each administrative area. Criteria of forests under threat or at risk should be defined bilaterally or between parties involved.

Step 4: Monitoring the change in area of the targeted forests and total forest fraction in participating districts and measuring the carbon stock

Step 5: Providing incentive to the country based on the achievement of maintaining the targeted forest areas and forest fraction in the administrative areas (country).

E. Improving the understanding of REDD :

Improving understanding on REDD should include understanding on the drivers of deforestation. Although drivers of deforestation vary among countries, also timing of occurrence, they share common drivers, mainly economic, in some cases social aspects.

In Brazil, for example, deforestation was driven by the increase demand of soybean and beef in international market during mad-cow disease in Europe. Deforestation in Indonesia was driven by high demand in timber and palm oil as well as rubber during Indonesian forestry sector had been the second back bone of national economic development between 1980s – 1990s. In terms of direct employment, the sector accounted in 1990 for about 1.35 % of labor force, and if indirect employment attributable to forestry were added, the percentage increased to 5.4 %. Forestry sector provided livelihood for some 4 million families. The recorded contribution of forest royalties to the national budget was US $ 65 million in 1997/1998, while the gross total royalties and other government revenues from forest operation exceeded US $ 1.1 billion per annum (FAO, 1998; Nasendi, 1997).

Other cause of deforestation was forest conversion for settlements to support transmigration programme during 1980s. Transmigration was one of national priority programmes intended to balance population and development between Java and outer islands as well as to improve well being of the migrated people. For these purposes and to anticipate the needs for land in the future, by law it was allocated 26.6 million ha of forest land which could be converted to other land uses.

Population increase has also contributed to deforestation because of the demand of land, forest products and servives. Indonesian population in early 1980s was about 147 million, deforestation rate accounted for 1 million ha/year, while in 2000 Indonesian population was 206 million, and deforestation rate data showed about 2 million ha/year. And so, deforestation, without any incentive intervention, will continue to occur as naturally needed along with the increase of world population and their needs for lands, forest products and services.

Illegal conversion such as encroachment by local people including shifting cultivation and other actors for commercial purposes was recorded as one of the drivers of deforestation. Shifting cultivation especially which applied cut and burn techniques was not a serious problem with small population, however, along with the increase of people practicing shifting cultivation, the problem then recognizable and will be a main cause of deforestation without appropriate positive incentives to tackle its root cause.

Forest fire both because of natural phenomenon and human induced fires has also been a predominant cause of deforestation in Indonesia. Forest fire occurred in 1997/1998 was a combined El-Nino effect and human induced fire, caused forest lost of about 10 million ha and increase 1 Gt C equivalent to 2 ppm CO_2. Forest fire on peat lands in 2005 contributes a significants amount of carbon emissions. Controlling forest fire in peat land is technically and economically challenging for Indonesia. Peatland alone, recorded as the highest carbon storage as well as source of emission, covers about 10 percent of the country area, and plays important role not only for environment, but also economic and social functions.

F. Relevant Provisions of Other Conventions, including CBD, CCD, RAMSAR Convention, UNFF, ITTO, WTO

At the international level, other than under UNFCCC, CBD, and CCD, forestry sector is also regulated under various conventions and international agreements or forum such as RAMSAR Convention, UNFF, ITTO, WTO/GATT and a number of other international and regional agreements or forum. While each convention and/or agreements or forum emphasize the importance of maintaining the sustainability of the resource in providing goods and services, non of these agreements provide adequate economic incentives that could encourage country which own the forest voluntarily doing so. For example, SFM which is dealt in ITTO, WTO, UNFF, does not receive market incentives, rather, the requirement to practice SFM is more as *non-tariff barriers* for many producer (mostly developing) countries.
