

## Peatlands and Global Warming: A Study with Special Reference to South-East Asian Countries

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**Abstract:** All kinds of Peatlands have innumerable environmental and social functions. They are considered as an ideal habitat for plant and animal species. Conservation of peatlands means conservation of that class of biodiversity. This role gets significant in peatforests. Peatlands regulate water cycle as they have about 90 per cent water in them which regularly supplies good quality water to underground water channels. Peatforest absorb carbon dioxide (CO<sub>2</sub>) via photosynthesis. All kinds of peatlands, in totality, are considered as a very large carbon mass. Thus, from peatlands environment is protected and inhabitants get livelihood. When they decompose or get drained, they release a large quantity of CO<sub>2</sub>. If they are not properly managed, they release CH<sub>4</sub> along with CO<sub>2</sub> which cause global warming. The problem which the world right now is facing is that the total areas of peatlands are fast reducing for various reasons, e.g. mismanagement, facilitating agriculture, urbanization, growing oil palm plantations, and producing biomass energy. It is said that in South-East Asian countries, especially in Indonesia, peatlands are being drained and cleared for facilitating oil palm plantations. This is happening in spite of the fact that ASEAN countries of South-East Asia are members of the Ramsar Convention that aims at conservation of wetlands. There are legislations of the Member States, but it is said that their enforcement is poor. On the basis of facts, the paper evaluates these claims and offers suggestions for improving the conditions of this fragile ecosystem.

**Key words:** peatlands, peatforests, global warming, biodiversity, Ramsar convention.

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### INTRODUCTION

Globally, peatlands have more carbon reserves than all tropical rain forests taken together. As peatlands – also known as peat bogs – are made up of old plant materials which never fully decompose due to wet conditions forming a carbon bank and continue to slowly store more carbon under natural conditions. Peatforests have greater ability to absorb carbon dioxide via photosynthesis. The amount of carbon is estimated nearly as large as the atmospheric carbon dioxide (hereinafter CO<sub>2</sub>). According to one study, at least 550 billion tonnes of carbon are stored in peat globally which is 75% of all carbon in the atmosphere, or 70 years of fossil fuel emissions at the present rate. 30.5 million hectares of the total peatlands of the world are there in the tropics with 22.5 million hectares in Indonesia, 2 million hectares in Malaysia and 2.6 million hectares in Papua New Guinea. [1] Of South-East Asia's 27.1 million hectares, 12 million hectares are already deforested and mostly drained.[2] It is notable here that Indonesia stands at number 3, next to the United States and China, if we take into account total carbon emissions, including emissions from peats of the country. Less than 10% of the total peatlands in this region is protected as Ramsar sites or otherwise. Peats in this region of the world generally have thick peat cushion than other parts. Because of this reason they have relatively more carbon storage and greater chance of emitting CH<sub>4</sub> and CO<sub>2</sub>.

Peatlands, one of the largest carbon stores, is in peril because of their mismanagement, drainage, over flooding, fire, degradation, over logging and sacrificing them for oil palm plantations or erecting settlements and industries. All these activities degrade them and with the result of that carbon dioxide (hereinafter CO<sub>2</sub>) and methane (hereinafter CH<sub>4</sub>). CO<sub>2</sub> is emitted when they are oxidised or if there is forest fire which is serious and frequent during drought in tropical regions. Peats have a large quantity of water soaked in there. But if canals are made through them, they get dry very fast. If the weather is dry and sun is scorching, the drainage process becomes accelerated. Dry peats are prone to oxidation and fire. Even if there is no fire, they get oxidized and emit CO<sub>2</sub>. It is about 8,600 tonnes per year. It is also notable that when there occurs fire in

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peats, it cannot easily be subsided, as apparently there is no sign of fire, but when there is no rain, the fire comes out and flairs again. The thicker is the cushion the more are the chances of recurrence of such kind of forest fires. The draining and logging of peatlands makes them more vulnerable to fire. Degraded peatlands accounts for about 238 million tonnes carbon emission every year, about 90% of which is in Indonesia. There are similar estimates about deforestation and logging activities which testify these data. [3]

In short, peatland forests (hereinafter, peat forests) play a vital role in carbon cycle. If there is combustion due to over flooding or mismanagement, they emit CH<sub>4</sub> which has 30 times more warming effect by retaining heat. And if they are drained or deforested for any reason, or if there is fire, they emit CO<sub>2</sub>, which has relatively lesser warming effect; but because of its quantity, it causes more warming than CH<sub>4</sub>. Since CH<sub>4</sub> has shorter life and lesser in quantity, they are not so significant. [3] It is for this reason that peatforests are mainly studied in the context of carbon storage and carbon emission. It is notable that when peats are drained for reforestation – in the South-East Asia, they are mainly sacrificed for growing oil palm – the methane emission ceases but carbon emission multiplies. This happens due to fast oxidation of peats. These processes are partially offset by the uptake of CO<sub>2</sub> by the growing vegetation, and the accumulation of carbon in woody tissues and litter on the forest floor. This has been demonstrated by Kevin Black and Gerhard Gallagher in their article entitled “The greenhouse gas balance of peatland forest”. They have made it on the basis of several scholarly writings. [4]

### ***Seriousness of the Problem:***

Degradation and loss of peat forests around the world, including South-East Asia, is considered as a serious environmental and social problem. There are the following main reasons for it: drainage, deforestation for economic and other reasons, forest fire and poor enforcement of laws made for conservation of peatforests and other kinds of peats. In South-East Asia, peatlands, are being sacrificed for facilitating oil palm plantations. We know that peat forests, especially of tropical countries, are rich in biodiversity, they supply fish, they are ideal breeding place for a number of animal species, they provide fire wood rattan and medicinal herbs, and they offer genetic material for biotechnology research. The commonly employed practice is to clear peatforests by burning them if they cannot provide good quality usable timber. This causes health hazards to people living around, as unburned carbon particulate matters go into the atmosphere and people inhale them. Sometimes, if forestfire goes uncontrolled and cannot be contained, it might cause haze and reparatory problems in a large number of people. This has occurred several times in Indonesia, Malaysia and Singapore. There is the Asean Agreement on Transboundary Haze Pollution for preventing and fighting forestfires and haze in the ASEAN region. The Agreement obligates member countries to: (1) co-operate in developing and implementing measures to prevent, monitor, and mitigate transboundary haze pollution by controlling sources of land and/or forest fires, establishment of early warning systems, exchange of information and technology, and the provision of mutual assistance; (2) respond promptly to a request for relevant information sought by a state or states that are or may be affected by such transboundary haze pollution when the transboundary haze pollution originates from within their territories; and (3) take legal, administrative and/or other measures to implement their obligations under the Agreement. The Agreement could not do well because Indonesia did not ratify it. In March 2011 the country showed indication that it would soon ratify it. The other reason for its ineffectiveness is the lack of appropriate laws and poor enforcement of existing laws. Another problem is displacement of inhabitants of peatforests. Their interests, which are based on customary rights, are often ignored. The position in African and Latin American countries is more or less the same. The condition of peatlands in Western countries is relatively better because in most of the countries there, peatforests are not sacrificed for short-term economic gains. In totality, the destruction of peatforests around the world, especially in Africa and South-East Asia is at the rife. It is evident from the satellite images. We can take it as a serious problem. This position can be averted only when: states have political will to conserve peatforests and other peatlands, they do not use it for economic benefits e.g. for planting oil palm and growing paddy. States are keen to expand their palm oil production so that they could produce more biodiesel and make robust profit by selling it. This activity is relatively faster in South-East Asian countries, especially in Indonesia. [5] The Wetlands International notes that the demand for biofuels is one of the major driving forces behind the expansion of palm oil production. Indonesia and Malaysia alone produce 90 % of the world's palm oil. Unfortunately, however, up to 20% of plantations in South-East Asia are on peat soils, which until recently were covered by peatswamp forests. The seriousness of the problem can be known from the report entitled "Cooking the Climate" which reveals that the tiny Indonesian province of Riau in Sumatra is home to 25 per cent of the country's palm oil plantations. Current expansion plans are set to cover half of the province with palm oil plantations, representing an increase of 300 per cent. This might have devastating consequences for Riau's peatlands which store a massive 14.6

billion tonnes of carbon - equivalent to one year's global greenhouse gas emissions. [6]

Peat soils need to be drained to a depth of at least 70 centimeters before oil palm can be grown. But in practice they are drained to over 1 meter. Draining peat triggers the oxidation process. Under tropical conditions, this leads to early emissions of 70 to 100 tonnes or more of carbon dioxide per hectare. So, as Indonesia has over 1.5 million hectares of palm oil plantations on peatlands, drainage for palm oil there is likely to cause emissions up to 150 million tonnes of carbon dioxide in just one year. In fact, illegal logging and drainage are rapidly destroying the peat swamp forests in both Indonesia and Malaysia, resulting in annual emission of 2000 megatonnes (million tonnes) of carbon dioxide: 600 from decomposition and 1400 from fires. This is equal to 8% of all global fossil-fuel emissions per year. The demand for palm oil is estimated to double in the next two decades. The mandatory target of 10% biofuel use for transport in the EU countries by 2020 has already had a huge impact on peatlands. As a result, large new plantations are being planned without considering the wider consequences. In Indonesia, more than 50% of these concessions are planned for peatlands. [7] In Indonesia, during the Suharto regime, 10,000 sq km area of peatlands was drained and cleared for facilitating paddy farm. The observations of the Wetlands International are in line with what has been stated above. However, the position in Malaysia is not that serious, as the oil palm plantations on peatlands in the country are relatively low. There is a plan to increase production of biodiesel using palm oil to 5.7 per cent by 2010 and 10 per cent by 2020. It is planned to increase the percentage by 2030. The author is of the opinion that there should be a credible international certification system which certifies that the palm oil and biodiesel intended to be exported is not of peatlands origin. Importing countries should be careful about it. But for economic reasons, for the time being, it seems to be difficult. However, if later there remains pressure of importing countries, especially India, China with respect to palm oil imports and EU countries with respect to import of biodiesel, then only some kind of certification will have to be strictly enforced. If we have this kind of certification and verification system under an international body, it can work. The author is of the opinion that for this purpose, first and the foremost all palm oil producing countries should be asked to prepare an inventory indicating the clearance of all kinds of lands for planting oil palm. They should also be asked to amend their environment impact assessment (EIA) laws to include a clause that peatlands, which is thicker than 3 feet, should not be allowed to be converted for any use, including oil palm plantations. Right now, the Round Table on Sustainable Palm Oil (RSPO) has a certification system for certifying palm oil to be sustainable. RSPO was formed in 2004 with the objective of promoting the growth and use of sustainable oil palm products through credible global standards. It is a non-profit association with 460 members comprising producers, consumers, processors, traders, manufacturers, retailers, NGOs and banks. There are a number of requirements, as 8 principles and 39 criteria, known as RSPO Principles and Criteria (RSPO P&C) to be followed. A certification entity must conform to these. Palm oil produced by a certified company is known as certified sustainable palm oil (CSPO). There are four supply chain models. Any of these models has to be followed. The number of certified companies is increasing. The RSPO P&C standard is being reviewed to strengthen the criteria on sustainability with the consideration of issues such as high conservation value (HCV) areas and greenhouse gases (GHGs). This is mainly to address issues raised by environmental NGOs and individual environmentalists who showed concern about excessive clearing of forests, including peat forests and peatlands, for oil palm plantations, which resulted in excessive CO<sub>2</sub> emissions. (New Straits Times, 9 June 2011) The task of giving this certification can also be managed by RSPO.

#### ***The dynamics of greenhouse gases:***

As noted above, peat forests are the biggest source of carbon reserves and rich biodiversity. The amount of carbon reserves increases or decreases depending on the expansion or shrinkage of the forest area, density of vegetation and water content in peats which is built in hundreds of years. It can work as carbon sink when the area is large and rich in vegetation as in that case it absorbs a large amount of carbon dioxide and covers it into wood (carbon reserve). Likewise, the absorption of carbon will be relatively lower if the area is low or if the area is shrinking due to deforestation or if peats are drained out and it is not flooded again by natural rain or by governments initiatives. Continuation of drainage increases the oxidation process of peats i.e. converting them into CO<sub>2</sub> due to decomposition. So far CH<sub>4</sub> is concerned its emission is high when peats are wet. But their emission reduces with the increase of drainage. However, in exceptional cases, where drainage ditches are not properly maintained, CH<sub>4</sub> emission is there but at slower pace. When peatlands again become flooded the process is reversed i.e. CO<sub>2</sub> emission decreases and CH<sub>4</sub> emission increases. This kind of scenario can be observed when the canopy is too dense and the water content in peatland is high. At any point of time, in order to know the actual dynamics of greenhouse emissions vis-à-vis peatlands, we need to have an inventory, topographical study of peatlands, its water content and its vegetative condition.

***The Task Ahead:***

We have noted above that peat forests play a number of environmental functions. Notable among them are: regulating water cycle, regulating CO<sub>2</sub> and CH<sub>4</sub> emissions, providing an ideal breeding place for a large number of animal species, providing genetic material for biotechnology research, providing medicinal herbs, and sheltering forest inhabitants. All these press for conservation of the existing peatforests. Rather, reforesting the area that has already been deforested and flooding of the peatlands that are suffering from drainage. Oil palm plantations lure people and governments to convert peatforests and peat bogs into oil palm plantations. The Round Table on Sustainable Palm Oil (RSPO), a multi stakeholders' initiative for promoting the growth and use of sustainable palm oil, sets criteria to ensure that oil palm expansion does not destroy remaining forests. It has issued a certification as "certified sustainable palm oil", which, in effect, ensures before issuing certification that the palm oil intended to be marketed or exported has been manufactured in a sustainable way. But the irony is that it does not address the loss of peatforests. It does not emphasize on restoration and conservation of peat swamps. It does not mean that the RSPO will not take into consideration sacrificing peat swamps for the sake of expanding oil palm plantations. Rather, the author is of the opinion that this problem should be urgently tackled by the RSPO before peatlands suffer irreversibly, and, in turn, contribute to the phenomenon of global warming. It is also to be noted here that there should be a policy and laws for giving effect to the policy and proper enforcement of the law. The author is of the opinion that in spite of the fact that because of complex ecosystem of peatforests and due lack of enough trained personnel it is difficult to properly enforce the laws. However, states should have political will and should make their best efforts to enforce the laws. For example, Indonesia has a law that no development will take place on the swamp lands if the density of the peat is more than 3 feet. This law can easily be enforced. So is the case of issuing logging licenses in peatforests. If there is proper inventory of all peatforests and if law pertaining to environment impact assessment is properly enforced, their conservation will not be difficult. In the process of conservation of peatforests, forest inhabitants can play a vital constructive role if their customary rights are recognized and they are also involved in developmental activities so that they could also get a share of the money generated from peatforests. These are more important in tropical regions of the world, including South-East Asia. The author also holds the view that in the protection of peatforests, developed countries should also equally participate in the peatforest conservation processes, including preventing them from loss and flooding them, as they are notable sinks for atmospheric CO<sub>2</sub>. The most important task ahead is not to sacrifice peatlands for oil palm plantations. So far biofuel is concerned, Malaysia, Indonesia and other countries should emphasize on producing ethanol, a type of biofuel which is being largely used by the United States, Mexico, Brazil and other countries. In order to embark on it, these countries will have to grow raw materials for manufacturing ethanol.

***Interface Between Peatlands and UNFCCC and the Kyoto Protocol:***

In 1992, at the United Nations Conference on Environment and Development (UNCED), the main agenda was to have a blueprint for over all sustainable development mechanism to facilitate development without impairing the interest of coming generations. It is for this reason that along with Agenda 21, a comprehensive mandate for sustainable development, the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention on Biological Diversity (CBD), the Convention on Combating Desertification (CDD) and the Forest Principles were signed. These conventions, along with the existing ones, provided a comprehensive scheme for stabilizing global average temperature and conserving the biological diversity. In fact, both are related to each other. If there is global warming resulting to unusual weather conditions, the ultimate sufferers, along with the human mass, will be the biodiversity of the world; likewise, if there is loss of forests, including peatforests, the global temperature will faster rise. We have already noted above that oxidation of peatlands, loss of peatforests for any reasons and combustion of peats will emit main greenhouse gases, CO<sub>2</sub> and CH<sub>4</sub>. Although the UNFCCC did not provide any concrete measure for greenhouse gasses (GHGs) alleviation, it emphasized on stabilizing them within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. (article 2) The convention divides countries into two groups: Annex I countries, which are developed countries, and non-Annex I countries, which are developing and least developed countries. Since developed countries, especially Organization of Economic Development and Cooperation (OECD) countries, emit more GHGs, they should reduce their emission levels. On the contrary, developing and least developed countries are not so responsible for the phenomenon of global warming, which is the result of excessive GHGs emissions and they need to develop at relatively faster pace, they be allowed to have leverage and liberty to increase their GHGs emissions. The Kyoto Protocol, made under the UNFCCC,

came out with an emission mitigation programme which aims to reduce GHGs emissions by 5.2% at 1990 level between 2008 and 2012. It provides for Emission Trading (ET), which is a sale of 'emission credit' held by a country having emission rights as it is below the threshold level. This kind of transactions can be between authorized companies or between a state and a company or between states. This money is utilized in upgrading to install and manage pollution control systems in the seller country. If an Annex I country has helped another Annex I country for carrying out low emission projects, the country gets emission rights to the extent of emission reduction in the other country. This is known as Joint Implementation (JI). Right now, most of the power generation plants are being upgraded to emit least CO<sub>2</sub> in Russia and Ukraine under this mechanism. If the same thing is done in a developing or least developed countries, it is known as Clean Development Mechanism (CDM). The emission reduction of each CDM project is known as 'certified emission reduction' (CER). The CDM is recognized by the CDM Executive Board and operates under the Conference of Parties (COPs) of the UNFCCC. Each Member state fixes an approval authority, as in Malaysia there is a Designated National Authority (DNA). The Protocol also requires that there should be an independent third party known as Designated Operational Entity (DOE), approved by the CDM Executive Board, which has the role to protect the environment, to facilitate the emission trading and to protect the interests of stakeholders. CDM cannot come into operation without a CER for it. In Malaysia, Sirim QAS International has been accredited by the CDM Executive Board as a DOE. (New Straits Times, 9 June 2011) Malaysia's coal fired power generation plants are being upgraded under this scheme.

The Kyoto Protocol addresses afforestation, reforestation and deforestation. Afforestation activities come under the CDM scheme. But the Protocol has addressed the deforestation problem also. (article 3) Under Reducing Emissions from Deforestation in Developing Countries (REDD) is also a mechanism for protection and reforestation in developing countries. Under this, technical and financial support can be provided to developing countries. It also addresses deforestation and degradation of peat swamps by protecting them from being sacrificed for palm oil plantations, growing paddy or for any other use. But the problem is that these facilities are not applicable to the forests logged before 1990, but most of the peatlands have been deforested or destroyed after 1990. At the 2006 COP, peat fires in Tropical forests of South-East Asia was discussed at the initiative of the Wetland International, however, unfortunately there was no concrete outcome as the delegated failed to reach any decision on peatforests. On the contrary, plans were considered by the United Nations to provide CDM benefits for biofuel production. This could have worsened the conditions of the tropical forests. The author is of the opinion that it would have been better if CDM would have been given for reforesting all kinds of tropical forest, including peatforests to qualify for CDM without any time limit. Also, there should not be any incentive for over logging of normal forest or clearing of peatforests for the sake of planting oil palm, because oil palm plantations are not a replacement for virgin forests or plantation forests. Unfortunately most of the funding for approved CDM projects in Malaysia and Indonesia are with respect to facilitation oil palm plantations. It is a known fact that in these countries, mainly in Indonesia, oil palm plantations on peatlands is common. There are calls for large scale funding for biofuels by CDM and Joint Implementation, which if becomes successful, will greatly increase the amount of CDM funding. [8] Due to ever-growing demand of biodiesel in EU countries, under European Biofuel Directives, and the European Biofuel Action Plan, they are might provide incentives along with CDM benefits. If this is done, it will be detrimental to forests, including peatforests, especially in South-East Asia. The author is of the opinion that for short-term gain by increasing the production of biodiesel, destruction of the environment and its processes is not at all a wise option.

Drainage of peatlands and consequential release of CO<sub>2</sub> has not been properly addressed in the Kyoto Protocol. This has been presented by John Couwenberg under these points: "1. Emissions from pristine peatlands are excluded from reporting. Consequently, reduction of naturally occurring CH<sub>4</sub> emissions through drainage may not be accounted as emission reduction. Drainage as a CH<sub>4</sub> emissions reduction measure would furthermore disagree with the Kyoto Protocol objectives e.g. to protect carbon reserves, and to honor other international conventions like CBD and Ramsar Convention. 2. If a peatland is drained for afforestation GHGs emission from peat degradation must be reported under ARD activities. Accounting of these emissions is mandatory. Emissions associated with maintenance of drainage ditches fall under Forestry Management and their accounting is facultative. On an annual basis, these emissions are usually much smaller than biomass increase of tree stands and Forestry management as a rule constitute as a net sink. Therefore, countries are likely to include it their accounting under the Kyoto Protocol. 3. With respect to emissions from peatlands drained for agriculture a difference needs to be made between CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. 4. Emissions from peat used ex-situ as horticulture substrate are treated like other emissions from agriculture. The Kyoto protocol does not cover the emissions caused by production of horticulture peat though, or those caused by production of energy

peat. Emissions from burning peat for energy are included under the energy sector of mandatory accounting. Classification of peat as biomass fuel would only leave GHGs emissions other than CO<sub>2</sub> in this sector, whereas, CO<sub>2</sub> emissions will be under facultative Land Use and Land Use Change and Forestry (LULUCF).” [9]

It has been a matter to worry to NGOs and environmentalists that peat is not included in the CDM. With the result of that Annex I countries do not bother for, conserving, re-flooding and reforesting peat bogs. There was a long pending demand that peatland and peatforests, should be brought within the fold of the carbon trading mechanism of the Kyoto Protocol. Environmentalists were expecting that at the December 2007 UN Climate Change Conference of Bali this issue will be the part of discussion and something positive will come out of that. The whole idea was to provide funding for preserving existing peats, most of which are at the brink of total drainage and destruction.

### **1. Peat to Energy:**

In European countries, drained peats had been used for generating energy for a very long time. Peat was used as biomass by households for cooking and heating. It remained so for a very long time. The idea of draining peats and using them as biomass power generation became common in many countries of North Europe. At a later stage, the idea from peat to energy also became popular in developing countries of Africa and Asia, including Malaysia and Indonesia. But this practice became unpopular for two reasons: environmental consciousness which gathered opinion in favour of conserving peatlands and peatforests of the world; and gas and coal became more popular for thermal power generation. For example, in Malaysia, energy from peats is no more in practice. However, still there are countries that are using peats or peats mixed with wood chips (for reducing the adverse impact of minerals in peats) as a supplement to total power generation of the country.

There are few developed countries which are also practicing this. The survey conducted by the International Energy Council reveals that “According to statistical data collected by the International Peat Society (IPS), energy peat production in Europe in 1999 was 21.5 million tonnes of air-dried peat. Finland was a leading energy peat producer in terms of volume, with some 7.5 million tonnes of production. The second in rank was Ireland with 4.7 million tonnes, and the third the Russian Federation with 3.7 million tonnes of production. Belarus, Sweden and Estonia followed as the next largest producers. Compared with the situation in 1990, the use of energy peat has slightly decreased, but the same countries are involved as in 1990. Energy peat is mainly used locally, but small amounts of peat briquettes have been exported from Estonia to Sweden and Finland, sod peat from Estonia, Scotland and Finland to Sweden and milled peat from Finland to Sweden. There have also been experiments in importing a few parcels of milled fuel peat from Russia into Finland. The total production area of energy peat in Europe was 113 000 ha. Including the USA, Canada and South Africa, horticultural peat was produced on an area of 100 000 ha. IPS data show that there were over 800 companies producing peat in 1999, with a labour force contributing an average of about 32 000 man-years.” [10] The best approach about peat is not to treat them as fossil fuel. They are biomass. It is also better if we consider it as a limited alternative energy source. There is possibility that when oil and gas become expensive and coal falls short, states may tend to use peat again for generating electricity. The author is of the opinion that for peats to be used as energy, we should have a holistic approach. We should not only rely on the fact that burning peat for energy there will be less environmental pollution. If any peat area has already become dry and there are no chances of re-flooding them, they can be used as an alternative energy source. But draining peats and then using them for power generation is not advisable. While doing so, we should uphold the treaty norms of the Ramsar Convention.

John Couwenberg is of the opinion that comparing peat with coal from the point of view of power generation is not a correct approach. For him, before and after part of the lifecycle analysis of peats from the point of view of GHG emissions is important. He is right because the UNFCCC and the Kyoto Protocol also emphasize on it. He pleads for a holistic approach on accounting as delineated by the UNFCCC/ Kyoto Protocol. He rightly concludes: Of course accounting on many if not most of the before and after use components of the life cycle is facultative. If a country selects to account for emissions/removals from one of the facultative LULUCF categories, then all emissions/removals from this category must be included. To include only those specific activities related to fuel peat extraction and leave out other emissions/removals from the same LULUCF sectors is not possible as it would invite selective inclusion of low emission activities and exclusion of high emission activities. This would result in a picture that looks good on paper, but is much worse in reality; it would leave the impression that the interest is not in saving the planet, but in using GHG emissions as merely another business tactic to make money.

The life cycle analyses of peat fuel combustion presented by the Swedish and Finnish peat industry are selective and unfair. They focus on worst case scenarios with respect to the 'before' and best case scenarios with respect to the 'after' components (see elsewhere in this Newsletter). Accounting under UNFCCC/Kyoto levels the playground, draws the larger, national picture and puts emissions from peatlands in the right perspective. As a result, the use of peat for energy becomes much less attractive."

## **2. Peatlands and the COPs of the Kyoto Protocol:**

It was expected that the efforts of NGOs and individual environmentalists to get more actions about conservation of tropical forests, including peatforests and peat bogs. But nothing much was done at the COP 13 in December 2007 at Bali. The Bali Action Plan did not include peatlands under the CDM mechanism. Nothing concrete could be done at the Bangkok also. This meeting also could not bring something concrete for supporting REDD, including peatlands. It is said that: "Destruction of tropical and peat swamp forests accounts for nearly 25 percent of global greenhouse gas emissions, and has always been among the most contentious and complex issues in the climate change negotiations. The international community committed to address deforestation in the 2007 Bali Action Plan [section 1(b)(iii)], pledging to create: Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries." [11] Nothing concrete could be done in spite of the fact that most of the tropical countries, especially Indonesia wanted peatlands to be included under the emission trading scheme of the Kyoto Protocol. [12]

The submission by the Canadian Parks and Wilderness Society's to the Copenhagen Meeting of April 2009 for a viable climate deal pertaining to forests and peatlands is remarkable. As a background, it states: 1. Ensuring national accountability for emissions from forests and peatlands is an important part of the current negotiations to arrive at a new global climate change deal under the United Nations in Copenhagen. This part of the negotiations is known as Land Use Land-Use Change and Forestry (LULUCF), which deals with emissions and removals of CO<sub>2</sub> from forest management, cropland management, grazing land management and re-vegetation. 2. Protecting intact ecosystems is the most effective strategy to keep carbon stored in forests and peatlands safely out of the atmosphere and to help biodiversity survive in the face of climate change threats to their habitats. 3. It is widely accepted that the current accounting rules for forests and peatlands under the Kyoto Protocol need to be improved. It recommended, along with other things, for the following strategies: 1. Accounting of carbon losses from peatland degradation is included as a new mandatory activity. 2. Accounting of carbon losses from forestry in primary forests and forest conversion to plantations, are included as new mandatory activities. 3. Accounting of GHGs emissions and removals from forest management is based on a comparison of actual emissions in the commitment period to actual historical levels. The notable among the suggestions is inclusion of peatland degradation in accounting of carbon losses. (CPAWS, April 2009)

Daniel Bodansky has given a fair and frank comments on the Copenhagen Accord in these words: The Copenhagen Accord established a bottom up process that allows each annex I party to define its own target level, base year and accounting rules, and to submit its target in a defined format, for compilation by the UNFCCC Secretariat. Under these terms, the Annex I countries 'commit to implement' their targets, individually or jointly, subject to international Monitoring, Reporting and Verification (MRV). (para 4) There has been widespread agreement that developing countries' Nationally Appropriate Mitigation Actions (NAMAs), that receive international support, should be subject to some type of international review, and that a 'matching mechanism' should be established to link developing country proposals with financing by developed countries. This consensus is reflected in the Copenhagen Accord, which establishes a registry for listing NAMAs for which support is sought, and provides that supported NAMAs 'will be subject to international measurement, reporting and verification in accordance with guidelines adopted by the COP'. (para 5) He further writes: 1. As with developed country emissions targets, it establishes a bottom-up process by which developing countries will submit their mitigation actions in a defined format, for compilation by the UNFCCC secretariat (including both autonomous and supported mitigation action). 2. It provides that Non-Annex I parties 'will implement' these actions. 3. It provides that developing country mitigation action actions will be subject to domestic MRV in biennial national communications, with provisions for 'international consultation and analysis under clearly defined guidelines that will ensure that national sovereignty is respected'. [13]

The Copenhagen Accord at the conclusion of the COP 15 is significant in the sense that it allocated money to be used for fighting GHGs emissions and decided that the average global temperature will not be allowed to rise more than 2 degree Celsius. It requires 1 billion dollars financial assistance by 2020. It provides detailed mechanism for REDD and LULUCF. It does not specifically mention about peatlands (and other

wetland), but under the schemes they are included. This move has been welcomed by Indonesia which is considered to be the main culprit in converting peatlands into oil palm plantations and agriculture. It National Council on Climate Change welcomed the Copenhagen Accord and pledged to achieve the target by 2020. The Plan includes peatlands along with forest, agriculture and energy. [14]

The COP 16 of Cancun in its declaration the “Cancun Agreement” simply provided the groundwork for a treaty to be formulated to replace the Kyoto Protocol. The Member state showed their collective will to fight against the global warming problem which is causing menace to many countries and people. 26 agreements were reached, including one for reducing emissions from deforestation and forest degradation (REDD+) mechanism, which goes beyond REDD also to include conservation, sustainable management of forests and enhancement of forest carbon stocks. As noted above, REDD has an objective to compensate developing countries for protection of their forests. It specifically emphasised on social and environmental safeguards and creating room for interim sub-national projects running under national monitoring and reporting systems. Unfortunately, it did not say anything about carbon trading for financing REDD. In spite of this, few environmental experts said that the decision of the COP 16 pertaining to forest was appreciable. John O. Niles commented that the Agreement included new decisions that would encourage donors and the private sectors to continue spend billions of dollars that would certainly lower deforestation and conservation of tropical forests. Lars Lovold cautiously commented that if we compare the decision here on forests with what was on the table two years ago, important progress had been made. The decision reflected the growing understanding that a broad and participatory approach, based on respect for the rights of indigenous people and the many vital functions of forests, was needed to prevent deforestation and forest degradation. *The Cancun agreement also opened the door for peatlands restoration as a tool for climate change mitigation.* This was welcomed by wetlands International and other environmental NGOs. However, there is general comment that there is great potential for reducing emissions from peatlands and tropical countries have realised it. Susanna Tol of Wetlands International wrote that negotiators could be able to reach an informal agreement on how to approach on how to approach peatlands. [15] The author is of the opinion that although nothing concrete was decided on the market mechanism to finance REDD, it has provided an impetus to it. Hopefully, concrete decisions of market mechanism will be discussed and finalized at the COP 17 in Durban.

### **Conclusion:**

Because of poor enforcement of laws and for short-term economic gains, international and national, sacrificing all kinds of peatlands is still unabated. This is resulting into loss of habitat, loss of biodiversity, loss of subsistence to inhabitants, loss and contamination of underground water channels, and tremendous increase of GHGs emissions. The Secretariat of the Ramsar Convention is making its best efforts individually and in collaboration with other relevant conventions, international organizations, and NGOs. But all these efforts have failed to yield a considerable success. Another problem is that reforestation and afforestation of razed peatforests cannot take advantage of the CDM of the Kyoto Protocol because most of peatforests have been deforested only after 1090. The latest COPs of the Ramsar Convention have brought little hope. In view of this, the author offers the following suggestions for conservation of peatlands and peatgorets: 1. Ramsar Member states must have political will to conserve this type of wetlands. 2. In order to transform their will into practice, they must have a policy 3. They should enact appropriate laws. 4. They should enforce them through a competent team of enforcement officers. 5. Member states must take extra care of their Ramsar Sites. 6. They must follow the certification system and develop a viable mechanism to re-flood drained peatlands. 7. The COP 17 should come out with a concrete mechanism on financing and market mechanism on REDD so that it could help peatlands also.

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