

Chapter 1

Introduction



1.1 Background and Importance of the Problem

There is a growing global concern on the issue of tropical forest conservation. There are many reasons for the concern. First of all, there is a fear that tropical forests may disappear totally in the future not very far from now if the depletion of the tropical forests continues at the current very rapid rate. Second, it is widely understood now that tropical forests are home for a number of rare species which are being extinct every year; therefore, the global community considers it is urgent to preserve tropical forests in order to save biodiversity which can not be recovered if once lost. Third, people on the earth are experiencing the irregularity of world climate and its catastrophic effects on the earth, i.e., floods, droughts, loss of low land areas, etc. These natural disasters are caused by global warming partly believed to have been triggered by the loss of tropical forests that absorb CO₂, a major cause of global warming.

Hence, it is felt urgent by the global community to reduce or stop depletion of tropical forests. Many serious efforts are being taken by a number of individuals, governments, NGOs and international organizations.

International Tropical Timber Organization (ITTO) is no doubt a unique and influential organization in this respect. Almost all major consumers and producers of tropical timbers are the members of this organization. ITTO is the only international organization specialized exclusively in tropical forests, and holds vast information and data on tropical timbers. ITTO, therefore, can be considered to be in the best position to handle issues related to tropical forests conservation.

The main question here is how ITTO handles this issue.

A detailed study on objectives of ITTA (International Tropical Timber Agreement) of 1994 and action plans of ITTO would reveal how this organization is designed to protect tropical forests.

ITTA of 1983 (International Tropical Timber Agreement of 1983) was adopted at a meeting among 63 countries in 1983 which was held in accordance with Resolution 93 of "Integrate Program for Primary Commodity" adopted by the Fourth General Assembly of UNCTAD held in Nairobi in 1976. ITTA of 1983 entered into force in 1985 and its headquarters was established in Yokohama, Japan.

ITTA is basically an agreement aiming to enhance economy of developing countries that are heavily depending on their income on exporting primary products. However, conservation of tropical forests and their genetic resources is also included, among others, in the objectives of the Agreement.

Reflecting the growing concerns of global community on rapid depletion of tropical forests, and responding to their determinations stated in Rio Declaration of 1992, the member countries of International Tropical Timber Organization (ITTO) decided to revise ITTA of 1983 into more conservation oriented agreement. After a series of negotiations, ITTA of 1994 was adopted. It entered into force in 1997.

1.2 Objective of the Study

The purpose of this thesis is to discuss how ITTA of 1994 envisages to contribute to the conservation of tropical forests that are diminishing rapidly. In order to discuss this, the objectives and mechanisms of ITTA of 1994 need to be examined in detail, then currently available economic theories are introduced with the purpose to verify the effective function of ITTA of 1994 in conservation of tropical forests.

The focus of this thesis is on the ITTO's Year 2000 Objective by which ITTO intends to make all tropical timber trade "sustainable" by the year 2000. In order to achieve this target, ITTA of 1994 stated in its Article 21 to establish a fund which would support those producing countries engaged in promotion of tropical forests conservation at the expense of their export. This fund is called "The Bali Partnership Fund."

Mechanisms or arrangements adopted by member countries of ITTO in creating such a fund can be examined theoretically by applying economic theories such as those stated below.

(1) Theories of Collective Actions

Each member country's contribution to the Bali Partnership Fund can be affected by the amount to be contributed from other member countries. Hence, the ITTO arrangements can be examined by the theories of collective actions.

(2) Theories of Common Pool Resources

Since environmental values deriving from tropical timbers are considered to be common pool resources, each member country's decision making process can be examined in accordance with theories of common pool resources. (The environmental values can be pure public goods but based on the fact that timbers themselves are depletable goods, they can be considered as CPRs)

(3) Other economic theories

Other economic theories relevant to tropical timber trade, such as theory of monopolistic market will also be briefly introduced.

By these theoretical approaches, the role and limits of ITTA of 1994 on tropical forest conservation could become clear.

1.3 Scope of the Study

In this thesis, a study is first conducted to verify the general function of contribution allocation arrangement under the Bali Partnership Fund. Then, further studies to verify the function of the Bali Partnership Fund for a few individual member countries are conducted. For producing member countries, Malaysia and Thailand are examined. Malaysia is the largest tropical timber exporter which still maintains the vast area of tropical forests, while Thailand is a net importer of tropical timbers which has already severely depleted its tropical forests. Therefore, comparison of these two countries would provide interesting implications on the effective function of the Bali Partnership Fund. For consuming countries, Japan is examined. Japan is the largest tropical timber importer of the world; therefore, its implication to the Bali Partnership Fund would be important.

1.4 Initial Understandings

1.4.1 ITTO and ITTA of 1994

(1) History of ITTO

The International Tropical Timber Organization (ITTO) was established in 1983 by an international agreement called the International Tropical Timber Agreement, 1983 (ITTA of 1983). The Secretariat was established in Yokohama, Japan, in 1986. One of the most important objectives of this organization is a commitment to achieve ITTO's unique Year 2000 Objective, which states that by the year 2000 all tropical timber products traded internationally by Member States shall originate from sustainably managed forests. [ITTO 1994, p15] The ITTO's governing body is called the International Tropical Timber Council. It is the highest decision-making organ and is composed of all members. The council meets twice a year, once in Yokohama, and once in one of the other member countries. On 1 January, 1997 a new accord, the International Tropical Timber Agreement, 1994, entered into force. As of October 1997, the ITTO's council is made up of 53 member governments, which between them account for 75 per cent of the world's tropical rain forests and over 90 per cent of the trade in tropical timber [MOFA 1997, p1].

(i) ITTO as a commodity agreement organization

Before going into details about ITTO's role in environmental conservation, it is imperative to touch upon the ITTO's background as a primary commodity agreement organization. ITTA of 1983 was basically designed as a commodity agreement to enhance economy of developing countries heavily depending on timber export. Without proper understanding of this basic characteristic of ITTA as a commodity agreement, ITTO's role in tropical forest conservation may not be fully understood.

Primary commodity markets are generally considered different from markets for industrial goods. Commodity prices are known to fluctuate much more than prices of industrial products. This instability has been imposing problems to both producers and consumers. Also, commodity prices have been declining and they would continue to decline.

Primary commodities are very often the backbone of the economies of developing countries. Hence, commodity agreements are established to support such developing countries by introducing multilateral measures to guarantee reasonable income from commodity trade. Such measures include production quota allocation and buffer stock system. Perhaps, the single most important characteristic of commodity agreements is the fact that price intervention mechanisms are allowed as an exception of free trade under GATT if they are organized in accordance with commodity agreements. [GATT 1947, XX(h)] However, as trade liberalization expands under GATT framework, most commodity agreements have abandoned these price intervention mechanisms. Today, the commodity agreement organizations are functioning mainly as consultation bodies and information centers. These roles, however, are still very important.

The Article 20 (h) of GATT accepts "*trade measures undertaken in pursuance of obligations under any intergovernmental commodity agreement*"

There are two other articles that support the trade intervention measures that can be adopted by ITTO.

The Article 20 (b) accepts "*trade measures undertaken to protect human, animal, or plant life or health.*"

The Article 20 (g) accepts "*trade measures necessary to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption.*"

These articles clearly allow international commodity agreements to take price intervention measures to protect natural resources.

Thus, international commodity agreements can control trade flow of natural resources against the forces of free markets. If ITTO decides to change the price level of tropical timber logs and its products against market forces with the aim of tropical forests conservation, it can be done without breaching GATT principles. This is indeed a great advantage of ITTO in its conducting tropical forests conservation.

Table 1. shows that the large portion of the 10 core commodities of the Integrated Programme for Commodities (IPC) still comes from the developing countries.

For 24 IPC primary commodities listed in the table 1., the Developing Countries' export share has remained about the same over 20 years, while total output increased. The real volume of commodity trade has grown by 91% between 1975 and the mid 1990's. This demonstrates that primary commodities still play an important role in the world economy of today.

Many developing countries are still heavily dependent on commodity production and trade. Problems of commodity production and trade still remain of great importance for developing countries. Developing countries have been suffering from the negative trend in commodity prices for the last three decades. Commodity dependent countries, therefore, gain smaller profits from the world trade which is promoted through global trade liberalization. Tropical timbers are not exception from this adverse trend in commodity prices.

For these reasons, commodity agreements are still considered a necessary and effective mechanism.

Table 1: Developing Countries' Share in Total Exports of Selected Commodities

	1975 Exports, US\$M		1993 Exports, US\$M	
	Developing Countries	Developing % of World	Developing Countries	Developing % of World
Coffee	4025	94.3	5393	81.4
Tea	899	87.0	1893	82.6
Cocoa beans	1599	98.0	1731	94.1
Sugar	9232	76.3	5569	56.0
Natural rubber	1602	96.7	3367	97.0
Jute	625	81.7	532	85.7
Hard fibers	289	66.4	260	74.1
Cotton	3138	54.6	6129	59.4
Copper	3031	56.9	7358	54.9
Tin	1117	85.4	905	86.4
Total 10 core	25557	74.6	33217	66.4
Manganese ore	225	51.4	235	43.4
Phosphate rock	1738	68.2	619	69.9
Iron ore	2151	41.4	3337	43.9
Bauxite	424	80.15	718	87.2
Tropical timber	2539	63.2	13312	67.5
Vegetable oil	3753	37.3	9347	44.3
Bovine meat	513	13.7	1288	9.4
Bananas	755	93.0	2804	81.2
Rice			3166	63.7
Maize			1888	21.7
Spices	496	85.0	1017	74.3
Pepper			253	85.9
Copra			32	45.4
Nuts			442	58.5
Total selected above	38151	45.2	71676	45.8

Source: MOFA, 1993, *Commodity Agreements*

(ii) Objectives of the ITTO

The International Tropical Timber Agreement (ITTA) of 1983 was a legal document agreed by tropical timber producing and consuming countries regulating objectives and the basic structure of ITTO. The Agreement created the International Tropical Timber Council which determines the policy and projects. The Agreement establishes two categories of membership in the Organization, tropical timber producers and tropical timber consumers.

In 1994, a successor Agreement, the ITTA of 1994 (Appendix 1), was adopted after intensive negotiations between consuming and producing countries with regard to new environmental conservation clauses, and it entered into force as of January 1, 1997.

It is imperative to know the objectives of ITTA of 1994 in order to discuss its role in tropical forest conservation. By reading the entire objectives of ITTA of 1994 stated in its Article 1, it is quite clear what the ITTA of 1994 is expected to achieve by its founders.

Roughly, the objectives of ITTA of 1994 can be classified into the following three main categories.

- (1) To research, study and consult the issues related to tropical timbers.
- (2) To promote and regulate the tropical timber trade and its market.
- (3) To achieve sustainable management of tropical timber trade by 2000.

Among these objectives, the objectives in the third category which is newly created under the ITTA of 1994 in its Article 1 (c), (d), (k) and (l) are the objectives directly related to conservation of tropical forests. The concept of "sustainable management" was not introduced in the ITTA of 1983. Hence, it is very clear that the ITTA revised in 1994 tasks member countries with new objectives of tropical forest conservation. The global community is paying due attention how ITTO tackles this very urgent, important, and extremely difficult issue.

(iii) The ITTO Secretariat

It may be useful to briefly touch upon the administrative organization of ITTO*. The chief of the Secretariat is called the Executive Director and is responsible to the Council for the administration and operation of decisions made by the Council. Under the Executive Director, there are four Directors, each responsible for Economic Information and Market Intelligence; Reforestation and Forest Management; Forest Industry; and Management Services. Under each director, there are a few professional project officers. The Secretariat currently consists of 15 professional and 15 general services staff.

The Secretariat produces a number of precious publications on tropical timber and its trade. Among them, 'The Tropical Forest Update' is specially compiled to promote tropical forests conservation.

* The author of this thesis visited the Secretariat and interviewed the Executive Director and a few other Directors on April 3, 1998.

(iv) Financial Resources

Two accounts are established under ITTO of 1983 for financing administrative operation and project activities. The Administrative Account is funded by the compulsory contributions from member countries for carrying out the administrative work required by the Secretariat. The Special Account is funded by voluntary contributions from member countries and other agencies. Contributions to the Special Account are distributed for studies, projects and other activities approved by the Council. Conservation-oriented projects can be implemented under the Special Account.

(v) The Year 2000 Objective

In addition to these two accounts, the Bali Partnership Fund is newly established under ITTA of 1994 for financing the Year 2000 Objective. The Year 2000 Objective states that internationally traded tropical timber should be sourced from sustainably managed forests by the year 2000. This is a focal point for ITTO's efforts in pursuing the sustainable management of tropical forests through international cooperation and assistance.

(vi) ITTO member countries

As of December 1998, the following 53 countries and a region are registered as members of ITTO:

Australia, Austria, Belgium/Luxembourg, Bolivia, Brazil, Cameroon, Canada, China, Colombia, Congo, Corte d'Ivoire, Denmark, Ecuador, Egypt, European Union, Fiji, Finland, France, Gabon, Germany, Ghana, Greece, Guyana, Honduras, India, Indonesia, Ireland, Italy, Japan, Liberia, Malaysia, Myanmar, Nepal, Netherlands, New Zealand, Norway, Panama, Papua New Guinea, Peru, Philippines, Portugal, Republic of Korea, Russian Federation, Spain, Sweden, Switzerland, Thailand, Togo, Trinidad & Tobago, United Kingdom, United States of America, Venezuela and Zaire. As already

stated before, these countries roughly cover 75% of global tropical forests and 90% of global tropical timber trade.

(2) Rio Accords and ITTA of 1994

As stated in the above (1), ITTO is basically designed as a commodity organization. The ITTA of 1983 did not clearly specify its role in environmental conservation for tropical forests. It was UNCED (United Nations Conference on Environment and Development) held in 1992 and its so-called Rio Accords that, among other factors, paved a new way for ITTO to take a new role of tropical forests conservation. Therefore, it is necessary to know UNCED and Rio Accords to understand the role of ITTO in tropical forests conservation.

(i) Background of UNCED

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil in 1992, known as the "Earth Summit," marked the twentieth anniversary of the United Nations Conference on the Human Environment held in Stockholm in 1972. This Stockholm Conference was the herald of international efforts in dealing with environmental problems. When it was convened, the environmental problems were a new global issue.

Stockholm Conference put the environmental issues on the international agenda for the first time and set the basis for international community to take actions afterwards. Stockholm conference also established the United Nations Environmental Programme (UNEP), which is the primary international body that addresses global environmental problems.

After the success of Stockholm conference, some improvements have been observed in reducing pollution in industrialized countries, but a new type of environmental problems emerged. They are the radical alterations to entire planetary systems, such as depletion of the ozone layer, and global climate change. The world has become aware of the cross-sectorial relationships between the environment and the economy. The global community has also become aware that the inequities between

North and South are the most important hurdle that international negotiations have to overcome.

The decision to convene the UNCED reflected these changes. The World Commission on Environment and Development (WCED) issued in 1987 also made an important influence to convene UNCED. This so-called Brundtland report developed and introduced a new very important concept on environmental conservation, i.e., sustainable development. [Volger, p16]

The balance between environment and development, the core concept of sustainable development, has become a point of contention. The reconciliation between these two is not easy because industrialized countries wanted all countries to take actions to protect the global environment while the developing countries interpreted this unreasonable because for them it was like those who had damaged global environment were asking the new-comers to pay for the damage. Further, payments for such purposes are basically in the interest of industrialized countries.

(ii) Earth Summit

Based on the above background, the United Nations General Assembly called for a global meeting in 1989 that would address the effects of environmental degradation and international efforts to promote sustainable and environmentally sound development in all countries. This eventually led to UNCED held in 1992 in Rio de Janeiro, Brazil. The conference was attended by more than 35,000 people, including 106 heads of state. A number of NGOs and 9,000 journalists attended the meetings and other events surrounding the Conference.

The fundamental theme of the Rio Earth Summit was the reconciliation between economic development and environmental conservation. These ideas are embodied in the Rio Declaration on Environment and Development (the Rio Declaration), and Agenda 21. These two documents are called the Rio Accords as a set which were adopted by 154 participating countries at UNCED. The Rio Accords

focused on policies to make trade and environment mutually supportive, provide adequate financial resources, and encourage macro-economic policies conducive to environment and development.

By reading the Rio Accord, it is realized that the documents are designed as the basis for comprehensive development programs to be implemented for the future of the global community in every area where economic activity affects the environment. The Rio Accords encourage sustainable development policies that meet the growing needs in the developing countries.

Efforts currently being made by various international organizations are responding to this call. ITTO's Year 2000 Objective is also rightly in this direction.

(3) ITTO and Tropical Forest Conservation

Importance of sustainable forest management was highlighted by Chapter 11 of Agenda 21 ('Combating Deforestation') and the 'Forest Principles' adopted at UNCED.

It is also reflected in the following international conventions recently held:

International Convention to Combat Desertification (1994)

Convention on Biological Diversity (Rio, 1992)

Framework Convention on Global Climate Change (Rio, 1992)

UN Conference on Human Settlements (Istanbul, 1996)

World Food Summit (Rome, 1996)

These conventions are expected to reinforce ongoing national, regional and international activities in these areas, and drew international attention to the role of forests and trees in food security, biodiversity, sink capacity, and support in agricultural production systems.

Thus, many efforts, governmental and non-governmental, national and international, have been made to promote sustainable forest management. One of the most important international initiatives should perhaps be the International Tropical Timber Organization's 'Year 2000 Objective,' in which producing member countries have committed themselves to having all their internationally-traded tropical timber come from sustainably-managed forests by the year 2000.

As the only international organization specialized exclusively in tropical timbers, ITTO must and is expected to play a leading role in global tropical forest conservation. With almost all producing and consuming countries as members of this organization, if ITTO adopts rules the members should abide by to conserve tropical forests, such rules would become the best feasible measures.

1.4.2 Current Plight of Tropical Forests

(1) Rapid depletion of tropical forests

According to a FAO Report, the area of the world's forests, including natural forests and plantations, is estimated to have been 3,454 million ha in 1995, more than half of which was in developing countries. The area of tropical forests is estimated 1,790 million ha in 1995 (table 2) which corresponds to 37 percent of the total tropical land area. As the table 3 indicates*, almost entire net forest depletion in developing countries is being observed in tropical forests. Therefore, the global deforestation problem today is virtually the problem of tropical forest depletion.

Changes in forest cover in the tropical forests are mainly caused by expansion of subsistence agriculture and large economic development programmes involving resettlement in timber producing developing countries. In other words, timber harvesting is not in general a direct cause of deforestation. Construction of roads also has been a facilitating factor in some areas because they make previously remote forest areas accessible for farmers to cultivate. To be more specific, forest degradation is caused mainly by excessive collection of fuelwood, overgrazing, fire, and poor harvesting practices. International trade in forest products accounts only for 6-8 percent of world tropical timber production. [Barbier et al, p20]

* FAO Year Book 1997 is the basic source of the figures in tables of this chapter. Although the figures are relatively old, they are the latest figures available as of September 1998.

Table 2: Total forest area, related land area and population in 1995

Region	Land (M ha)	Forest	Forest cover as a % of total land (ha/cap)	Forest (M ha)	Other wooded land	Forest and other wooded land
Europe	550	149	27	0.26	46	195
former USSR	2,139	755	35	2.15	187	941
North America	1,835	457	25	1.65	293	749
Pacific (developed)	818	71	8	0.51	106	178
Africa	2,964	545	18	0.85	591	1,137
Tropical	2,237	529	24	1.09	554	1,083
Non- Tropical	727	16	2	0.10	38	52
The Pacific region	2,613	497	19	0.17	163	660
Tropical	901	338	38	0.21	115	453
Non- tropical	1,712	159	9	0.11	48	207
Latin America and the Caribbean countries	2,016	967	48	2.16	292	1,260
Tropical	1,650	924	26	2.31	267	1,191
Non- tropical	366	43	12	0.89	25	68
Developing countries						
Tropical	4,788	1,791	37	0.73	935	2,726
Non- tropical	2,806	218	7	0.13	111	329
Total developed	5,342	1,432	27	1.07	631	2,064
Total developing	7,594	2,009	26	0.50	1,047	3,056
Grand total	12,936	3,454	27	0.64	1,678	5,120

Source: FAO Year Book 1997

Further, while the world's forest area has been steadily decreasing as the table 3 indicates, there has been a continued increase in demand for wood products. Table 4 indicates that global consumption of wood may increase by 35 per cent between 1990 and 2010.

Many countries become more relying on plantations (Table 5). As table 3 indicates, the area of plantations in developing countries increased annually by 4.1 million ha during 1980-1990 period. However, the increase in plantations is still too small to offset the decrease in natural forests.

According to FAO, as the table 6 indicates, the tropical zone is classified into the following six zones:

Tropical rain forests

Moist deciduous forests

Dry zone

Very dry zone

Desert zone

Hill and mountain forests.

Nearly three-quarters of the tropical forest is in the tropical rainforest and the moist deciduous forest zones. Dry lowland and upland each constitutes about 12 to 13 percent of the total tropical zone forest.

Table 6 further shows that 77 percent of the land area in the wet zone is still covered with natural forest in 1995. The corresponding percentages are 46 in the moist deciduous, 19 in the dry and very dry and 29 in the hill and mountain forest zones. Original state of forests are not easily estimated but the entire wet zone, the moist zone and hill and mountain zone as well can have been completely forested. Hence, it can be said that 33% of wet zone and 71% of hill and mountain zone have been deforested so far by the human activities.

Deforestation and degradation are major tropical forest issues. For the 1980-90 period, the annual estimated loss in natural forest area is 12.1 million ha. This corresponds to deforestation rate of 0.8 percent (Table 6).

As the table 6 also shows that the lowest annual deforestation rate is observed in the wet zone. Deforestation rates are much higher in the moist, dry and hill and mountain zones. This may be because these zones have more favorable conditions for agriculture and high population pressure.

Now, let us briefly see the effects of deforestation rate of 0.8%. Although 0.8% appears quite small as a figure, accumulated effect is enormous. If deforestation continued at this rate of 0.8 %, in 30 years it will 27% and in 50 years it will be 49%. At this rate, the world will lose nearly 50% of tropical forests in merely 50 years. If the rate increase only by 0.2% to 1% a year, the effect is 10.5% depletion in 10 years, 34.5% in 30 years, and 64.5% in 50 years.

It should be noted, however, the above mentioned effects are those for natural tropical forests only. If the increase rate of plantation is counted, the net depletion rate can fall to 0.6% a year, though the damage to the tropical forests is still serious at this rate. (more detailed simulations are conducted in the chapter 3.2)

Table 3: Forest cover change for developing countries

Annual Change, 1980-1990

	Natural forest (M ha)	Natural forest cover as a percentage of total land	Net plantations (M ha)	Total forest*
Region				
Africa	-4.2	-0.8	0.23	-4.0
Tropical	-4.1	-0.7	0.13	-4.0
Non-tropical	-0.1	-1.0	0.10	0
Asia and the Pacific region	-4.4	-0.9	3.40	-1.0
Tropical	-3.9	-1.2	2.11	-1.8
Non-tropical	-0.4	-0.3	1.28	-0.8
Latin A. & the Caribbean countries	-7.7	-0.8	0.41	-7.3
Tropical	-7.4	-0.8	0.37	-7.0
Non-tropical	-0.3	-0.6	0.05	-0.3
Total tropical	-15.4	-0.8	-2.61	-12.7
Total Non-tropical	-0.9	-0.5	-1.37	0.5
Total developing	-16.3	-0.8	4.10	-12.1

Source: FAO Year Book 1997

Table 4: Current and projected consumption of forest products (1990-2010)

1990	*m3 or +tonnes (million)		
	World	Developed	Developing
Fuelwood and charcoal*	1,800	240	1,560
Industrial roundwood*	1,650	1,270	380
Sawnwood*	485	373	112
Panels+	125	108	17
Paper+	238	196	42

Growth (1990-2010)	percent		
	World	Developed	Developing
Fuelwood and charcoal*	1.4	0.8	1.6
Industrial roundwood*	2.5	2.0	3.8
Sawnwood*	2.5	1.5	4.1
Panels+	4.6	4.3	6.5
Paper+	3.1	2.3	5.8

2010	*m3 or +tonnes (million)		
	World	Developed	Developing
Fuelwood and charcoal*	2,400	280	2,120
Industrial roundwood*	2,700	1,900	800
Sawnwood*	790	500	250
Panels+	310	250	60
Paper+	440	310	130

Source: FAO Year Book 1997

Table 5: Natural forest and Net Plantations in developing countries

	1995	
	Natural forest (million ha)	Net plantations (million ha)
Region		
Africa	541	4.4
Tropical	528	2.1
Non-tropical	13	2.2
Asia and the Pacific region	441	56.2
Tropical	315	22.6
Non-tropical	126	33.6
Latin America and the Caribbean countries	960	7.7
Tropical	918	6.0
Non-tropical	42	1.7
Total tropical	1,761	30.7
Total non-tropical	181	37.9
Total developing	1,941	68.6

Table 6: Forest cover state and change by ecological zone for tropical countries

Ecological zone	Land (M ha)	Natural forest (M ha)	Natural forest cover as a percentage of total land	Deforestation 1980-1990 percent/year
Wet	935	715	77	0.6
Moist deciduous	1,294	591	46	1.0
Dry and very dry	1,241	238	19	0.9
Hill and mountain zone	719	203	28	1.1
Desert	589	8	1	1.0
Total tropical countries	4,778	1,756*	37	0.8

Source: FAO Year Book 1997

* Excludes some small tropical countries

(2) Biodiversity and tropical forests

As the global community is increasingly witnessing extinction of fauna and flora species, there has been a growing recognition that biological diversity is a global asset of tremendous value for present and future generations. The threat to species and ecosystems has never been seemed so great as it is today. Species extinction caused by human activities is occurring at an alarming rate. It is stated in the text of the Convention on Biological Diversity that "Concerning that biological diversity is being significantly reduced by certain human activities." The text is also "Stressing the importance of, and the need to promote, international, regional and global cooperation among States and intergovernmental organizations."

Responding to this concern of the global community, the United Nations Environment Programme (UNEP) launched a series of expert meetings on biological diversity in 1988 to explore the need for an international convention on biological diversity. Finally, the text of the Convention on Biological Diversity was adopted in May 1992 at the Nairobi Conference. The Convention was opened for signature at the Rio Earth Summit. It received 168 signatures in total. The Convention entered into force on 29 December 1993.

Biological diversity is most closely related with tropical forests conservation. There is an estimate that tropical forests contains almost half of the global fauna and flora species existing today, although the area is only one fifth of the total land in the world. As stated in the previous chapter, tropical forests are diminishing rapidly and thereby causing serious effects on biological diversity. [Stiling, p259] Biodiversity is affected not only by the decrease in the size of habitats but also the division made by roads and other human made obstacles. Therefore, the degree of threat to biological diversity is more serious than the rate of forest depletion. There is an estimate that as much as 150,000 species are being extinct annually. In general, at least 5,000 species are considered to be being extinct every year. Most of them are being lost even without being detected by human being. [Goodland 1991, p22]

(3) Global warming and depletion of tropical forests

Tropical forests conservation is viewed important also in relation with global warming. The average global temperature barely increased more than 0.5 degree Celsius since the turn of the century and the change is scientifically proven to have been caused by the so-called green house effect. CO₂ is identified as the major green house gas. Global warming will cause a number of serious natural disasters such as floods, drought and desertification. The most serious threat to the mankind could be the loss of land to the sea. The global temperature is expected to increase by 1 to 3.5 degree by the year 2100 and then the level of the sea surface will in average be 50 cm higher than today. [Nebel et al, p414]

Based on the above understanding, IPCC (Inter-governmental Panel on Climate Change) was established in 1988. IPCC issued a report in 1995 recommending that the level of CO₂ emission be reduced to half. Also, international efforts are being taken under the Framework Convention on the Climate Change (FCCC) adopted in 1992 to control the level of CO₂ emission in 2000 equal to the level observed in 1990.

Forests are important sources of carbon dioxide. The world's forests contain vast quantities of carbon. Forests also act as sinks and reservoirs by absorbing carbon from the air. Forests will need better protection and management if their carbon dioxide emissions are to be reduced. The CO₂ stored in trees, vegetation, soils, and durable wood products can be maximized through storage management. Plantation forests need to be increased as they absorb significant amounts of CO₂.

(4) Tropical Timber Trade

Naturally, the ITTO provides the best information and statistics on tropical timber trade. The following is mainly based on the ITTO's Annual Report 1996. (Appendix 2). This chapter provides data on production and trade of tropical timber products.

Total exports of primary tropical timber products by the ITTO producing member countries were \$11.5 billion in 1995, maintaining the same level from 1994. Of this total, Asia accounted for 79%, Africa for 14% and Latin America for 7%.

For logs, ITTO producing countries' export in 1995 were 15.0 million m³ valued at \$2.3 billion. Log exports in 1995 decreased 10% from the level in 1994. Log exports has been steadily declining for the past decade.

Sawnwood exports by ITTO producing member countries dropped 7% from the 1994 level to 7.9 million m³ valued at over \$2.8 billion in 1995. Although Malaysia remained the largest tropical sawnwood exporter in 1995, accounting for 53% of the total export volume of ITTO producing countries, Malaysia's decrease in sawnwood exports accounts mainly for the decrease in total. Malaysia intends to stop all sawnwood exports from Peninsular Malaysia by 2000 and this policy is expected to affect the sawnwood trade further in the future.

Tropical veneer exports by producing countries reduced by 4% from the level of 1994 to 1 million m³ valued at \$462 million in 1995.

Plywood export by ITTO producing members increased 10% from the level of 1994 to 12.4 million m³ valued at \$5.9 billion in 1995. Combined plywood export by Indonesia and Malaysia constituted 93% of ITTO producing countries' plywood exports in 1995.

Total consumer country imports of tropical timber products in 1994 were \$11.9 billion, dropping to \$11.7 billion in 1995, with Japan accounting for 37%, EU for 26%, China for 21%, and Korea for 9%. Imports of tropical timber products by ITTO

producing member countries in 1995 were \$1.5 billion, rising from \$1.3 billion in 1994.

Out of this figure, Thailand accounted for 71% and the Philippines for 11%.

Tropical hardwood log imports by ITTO consuming member countries dropped by 9% from the 1994 level to 14.6 million m³ valued at \$3.1 billion in 1995. Total tropical log imports by all ITTO members in 1995 were 17.3 million m³ valued at almost \$3.7 billion, when imports by producing members are included. This figure corresponds to 6% decrease compared to the level of 1994. Japan remained as the top importer of tropical logs in 1995, accounting for over 45% of all consumer country log imports. Japan's import, however, fell by 13% to 6.5 million m³ in 1995. Thailand is one of the major ITTO producing country log importers and imported 1.3 million m³ in 1995.

Thailand was ITTO's largest tropical sawnwood importer in 1995 but Thailand's imports of tropical sawnwood fell by 17% from the 1994 level to 2 million m³ in 1995. Japan's import of tropical sawnwood in 1995 was stable from the level of 1994 at 1.3 million m³. The decrease in total ITTO tropical sawnwood imports of by 4% in 1995 is mainly attributed to the decrease in Thailand's import.

Total veneer imports by all ITTO member countries increased by 12% to 1.1 million m³ valued at \$648 million in 1995. The increase in 1995 imports was primarily due to increases by China. China was the top ITTO importer of tropical veneer in 1995.

EU was the second, and Japan was the third largest ITTO tropical veneer importers.

Japan remained as the dominant importer of tropical plywood. Japan's plywood import increased by 8% from the 1994 level to 4.0 million m³ in 1995. This figure corresponds to 40% of total ITTO imports of 10.9 million m³ valued at \$5.1 billion in 1995.

Real prices for most primary tropical hardwood products by species were stable or declining from 1995 to 1996.

1.5 Limitations of the Research

(1) Limit of ITTO in conservation as a trade promotion organization

As stated in the Chapter 1.4, ITTO is basically designed as a tropical timber trade promotion organization. Its role in environmental conservation, therefore, has to derive from trade measures in principle. It may not be proper for ITTO to adopt direct measures for tropical forests conservation because it may be considered beyond the mandate given in the ITTA of 1994. This is the major weakness of the ITTO plans in achieving its year 2000 objective.

Weight of tropical timber trade in total tropical forest depletion is estimated as low as only 6%. [Babier, et. al, p20] The major causes of tropical forest depletion is now widely acknowledged to be slash-and-burn for local agriculture and settlement. Therefore, trade measures alone may not be able to reduce the rate of tropical forests depletion. Direct measures to reduce slash-and-burn practice in producing countries are usually considered imperative for tropical forests conservation.

It may be possible to use trade measure as a leverage to reduce slash-and-burn practice. Although the trade is not a major cause of tropical forests depletion, the income from tropical timber trade is still a very important source of foreign currency earnings for many of the ITTO producing countries. If ITTO can succeed in guaranteeing attractive income from tropical timber trade by introducing trade measures such as export quota allocation or buffer stock system, producing countries may willingly restrict depletion by slash-and-burn practice. Or the producing countries can be persuaded into accepting trade rules including sanction measures against those producing countries that do not manage their tropical forests resources sustainably. If such rules are established, the ITTO rules would provide proper incentives for the ITTO producers to take necessary measures to make their forests resource sustainable in order to avoid sanctions. These issues further need to be addressed by the ITTO member countries.

(2) Limit of ITTO in conservation as an international agreement organization

Although international agreements seem to be the best solution for addressing international environmental conservation problems, still there is a significant limit. International agreements provide the best possible legal frameworks that global community abide by where there is no authorities to force rules over sovereignty of each independent country. However, each member country of an international agreement has its absolute freedom whether to stay in the agreement or not. As long as each country remains as a member, it has obligation to abide by the rules set forth by the agreement but if it does not like to abide by the rules, it can withdraw from the agreement anytime.

Thus, ITTO as an international agreement can not force unwilling members to comply with tropical forests conservation measures that are not supported by these members. To some extent, the producing countries may compromise to take some measures of tropical forests conservation in order to stay in the organization that can provide some merits in tropical timber trade. If the conditions put forward by consuming countries are not acceptable, such conditions would not be agreed in the first place. If such conditions are introduced, the producing countries would not hesitate to withdraw from the agreement.

Hence, there is a significant limit in implementing tropical forests conservation measures by ITTO as an international agreement organization.

1.6 Methodology of the Research

Methodology of the Research in this thesis is introduced in detail in the Chapter 3. In short, the game theory is the basic analytical tool to be used in this thesis.

First, several general game models would be created to verify the general functions of the Bali Partnership Fund. Then, further several models would be created to verify the functions of the Bali Partnership Fund against a few individual member countries. As already mentioned before, Malaysia and Thailand are examined for producing countries, and Japan is examined for consuming countries.

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1.7 Benefits of the Research

There is no doubt that tropical forests conservation is an urgent and very important global issue today. ITTO is of course not the only organization which promotes tropical forest conservation. A lot of efforts are being made by the United Nations. For example, UNCED of 1992 and its agenda 21 may be the most well-known achievement made by the UN. Serious efforts are also being made independently by the major producing and consuming countries of tropical timbers, and by NGOs.

However, ITTO is the only international organization which has mandate to study the matters related only with tropical timbers. ITTO has been supported by major countries in the world and widely recognized to have played so far a very positive role.

Therefore, to conduct a research on ITTO and its role in conservation of tropical forests would be a important task. The knowledge about the role of the ITTO would be a very important asset for those who are concerned about tropical forest conservation.

Thailand is now a net importer of tropical timbers and its volume of trade is relatively small in the world tropical timber trade. Therefore, impact of ITTO's trade measures on Thailand may be marginal. However, the final goal of the ITTO's year 2000 objective is to conserve tropical forests by achieving sustainable management of tropical timber trade. Although Thailand may not be greatly affected by the tropical timber trade, both Thai government and the general public are concerned a lot about tropical forests conservation. Thailand has lost a vast area of tropical forests but because of this, Thai people, both government and the general public, show keen interest in preserving tropical forests locally or globally. Thailand used to be and will still be home for tropical forests and affection of the people on tropical forests is very deep. This is why the government of Thailand clearly supports the year 2000 objective and the Bali partnership Fund. If ITTO really achieves its target of sustainable management of tropical timbers, it will at least greatly satisfy the existence value of tropical forests felt by Thai people.