

**THE USE OF CRITERIA AND INDICATORS FOR MONITORING,  
ASSESSING AND REPORTING ON PROGRESS TOWARDS  
SUSTAINABLE FOREST MANAGEMENT  
IN MALAYSIA\***

by

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**1.0 INTRODUCTION**

1.1 Malaysia is a tropical country located north of the Equator within latitudes 1° to 7° North and longitudes 100° to 119° East. The total land area is approximately 32.83 million hectares with 13.16 million hectares in Peninsular Malaysia, which comprises eleven states and the Federal Territory of Kuala Lumpur, 7.37 million hectares in Sabah and the Federal Territory of Labuan, and 12.30 million hectares in Sarawak. Peninsular Malaysia is separated from Sabah and Sarawak by 720 km of the South China Sea, giving the country a coastline of almost 4,830 km.

1.2 The climate of Malaysia is typically humid tropical or wet equatorial and is characterized by year round high temperatures and seasonal heavy rain, especially during the North-East Monsoon from October/November to February/March. The mean temperatures during the day and night are 32°C and 22°C respectively. The average monthly temperature variation is about 2°C while diurnal temperature variation for inland and coastal areas are 8.5°C to 11°C and 5.5°C to 8.5°C respectively. The average annual rainfall is about 2,540 mm with a maximum of 5,080 mm and a minimum of 1,650 mm. Humidity is always high and ranges from 70% to 98% and the sky is cloudy most of the day, especially during the monsoon months.

**2.0 CONSTITUTIONAL PROVISIONS**

2.1 Under Article 74 (2) of the Malaysian Constitution, forestry comes under the jurisdiction of the respective State Governments. As such, each state is empowered to enact laws on forestry and to formulate forestry policy independently. The executive authority of the Federal Government only extends to the provision of advice and technical assistance to the states, training, the conduct of research and in the maintenance of experimental and demonstration stations.

2.2 In order to facilitate the adoption of a co-ordinated and common approach to forestry, the National Forestry Council (NFC) comprising the Chief Ministers of the thirteen Malaysian States and chaired by the Deputy Prime Minister, was established on 20 December, 1971 by the National Land Council (NLC). The NLC is empowered under the Malaysian Constitution to formulate a national policy for the promotion and

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control of utilization of land for mining, agriculture and forestry. The NFC serves as a forum for the Federal and the State Governments to discuss and resolve common problems and issues relating to forestry policy, administration and management. All the decisions of the NFC have to be endorsed by the NLC. The responsibility for implementing the decisions of the NFC lies with the State Governments unless it is within the authority of the Federal Government.

### 3.0 **FOREST RESOURCES**

3.1 At the end of 2000, the total area of forests in Malaysia was estimated to be 19.84 million hectares or 60.4% of the total land area, with the proportion of forested land being higher in Sabah and Sarawak than in Peninsular Malaysia, which is more developed as shown in Table 1 of **Appendix 1**.

3.2 Of the total forested area and recognizing the crucial role of forests is not only in the production of timber, but more importantly in the conservation of soil, water and wildlife, as well as in the protection of the environment, Malaysia has a total of 14.44 million hectares of forested land designated as the Permanent Forest Estate (PFE) which is under sustainable management. Approximately 10.60 million hectares of the PFE are production forests with the remaining 3.84 million hectares being protection forests. The status of the PFE in Malaysia is summarized as in Table 2 of **Appendix 1**.

3.3 Since the 1930s, Malaysia has been establishing a network of protected areas, such as national parks, and wildlife and bird sanctuaries, for the conservation of biological diversity. Currently, Malaysia has 2.15 million hectares of conservation areas protected by legislation as shown in Table 3 of **Appendix 1**. Of these, 1.83 million hectares are located outside the PFE, whilst another 0.32 million hectares are located within the Estate.

3.4 In its efforts to further conserve various forest and ecological types in their original conditions, the Forestry Departments have also set aside pockets of virgin forest. These pockets, known as Virgin Jungle Reserves (VJR), were established to serve as permanent nature reserves and natural arboreta, as controls for comparing harvested and silviculturally treated forests and as undisturbed natural forests for general ecological and botanical studies. Since its inception in the 1950s, a total of 83 VJRs covering 21,506 hectares were established throughout Peninsular Malaysia while in the state of Sabah, a total of 48 VJRs had also been established covering an area of 90,442 hectares. These VJRs represent samples of the many types of virgin forest found in the country which are located in the PFE. Represented forest types include Mangrove Forest, Heath Forest, Peat Swamp Forest, Lowland Dipterocarp Forest, Hill Dipterocarp Forest, Upper Dipterocarp Forest and Montane Forest.

3.5 Hence, with the protection forests of the PFE of 3.84 million hectares, the totally protected areas designated for the conservation of biological diversity in Malaysia are now estimated to be 5.67 million hectares, representing 28.6% of its total forested land or 17.3% of its land area.

## 4.0 **FOREST MANAGEMENT**

4.1 Since the establishment of the Forestry Department in 1901, the forests in Malaysia have been systematically managed. Over the years, ecologically and environmentally sound forest conservation and management practices have been developed to ensure that the forest resources in Malaysia are managed for the sustainable production of timber and non-timber products, in enhancing climatic stability and ecological balance, the safeguarding of water supplies and environmental quality, and in the conservation of biological diversity.

4.2 In Peninsular Malaysia, the Dipterocarp Forest of the production forest of the PFE is managed under two management systems, namely the Modified Malayan Uniform System (55-year cutting cycle) and the Selective Management System (30-year cutting cycle). In brief, the Modified Malayan Uniform System consists of removing the mature crop in one single felling of all trees down to 45 cm diameter at breast height (dbh) for all species, while the Selective Management System (SMS) entails the selection of optimum management (felling) regimes based on pre-felling forest inventory data.

4.3 Under the SMS, the cutting limit prescribed for the group of dipterocarp species would not be less than 50 cm dbh, except for *Neobalanocarpus heimii* (Chengal) where the cutting limit would be above 60 cm dbh, while the cutting limit prescribed for the group of non-dipterocarp species would not be less than 45 cm dbh. The difference in the cutting limits prescribed between the dipterocarp species and that of the non-dipterocarp species would be at least 5 cm in order to conserve a higher percentage of dipterocarp species for the next cut.

4.4 In pursuance of sound management objectives, forest harvesting in the state of Sabah is undertaken in accordance with the prescribed silvicultural practices of promoting the development of natural regeneration. In this context, the Dipterocarp Forest in the state of Sabah is selectively harvested based on a 50-year cutting cycle and only trees having size of 60 cm dbh and above are removed.

4.5 In the state of Sarawak, the cutting cycle prescribed for the Dipterocarp Forest is 25 years with the prescribed cutting limits for the dipterocarp and non-dipterocarp species being 60 cm dbh and 45 cm dbh and above respectively.

4.6 Currently, the Peat Swamp Forest in Peninsular Malaysia is managed under the 'modified' SMS where higher cutting limits are prescribed due to a lower stocking of natural regeneration in the stand. Research and development efforts are currently being taken to formulate more effective management system for this forest type. In this regard, the cutting cycle adopted for the Peat Swamp Forest in the state of Sarawak is 45 years with the prescribed cutting limits for *Gonystylus bancanus* (Ramin) and that of the other species being 40 cm dbh and 45 cm dbh and above respectively.

4.7 The Mangrove Forest, in general, is managed under cutting cycles varying between 20 to 50 years. However, currently there is no commercial harvesting of mangrove forests in the states of Sabah and Sarawak, while in Peninsular Malaysia mature trees are clear-felled with the retention of seven mother trees per hectare, and a

three meter wide river bank and coastal strip for ensuring adequate natural regeneration and in the protection of the environment.

4.8 The practice of selective harvesting of the inland forests in Malaysia would ensure that the larger trees that remain would reach maturity in 25 to 50 years to allow for a second round of harvesting. And the process goes on. This in itself is a form of silvicultural treatment because natural regeneration is increased by the gaps created during forest harvesting. Several studies have also indicated that regeneration of desirable species occur naturally in and around the gaps left by logging, and only when necessary, the logged-over forests are silviculturally treated to aid in their rehabilitation.

4.9 In fact, the forest management objectives are clearly enunciated in the National Forestry Policy which was formulated and approved by the NFC and later endorsed by the NLC on 19 April, 1978. This Policy is being implemented by all the states in Peninsular Malaysia, while the objectives of the Policy are also being implemented in Sabah. In the state of Sarawak, the Forest Policy which was approved by the Governor-in-Council in 1954 and having very similar provisions to the National Forestry Policy has remained the basis for forestry practices. However, with the recent concern by the world community on the importance of biological diversity conservation and the sustainable utilization of genetic resources, as well as the role of local communities in forest development, the National Forestry Policy was revised in 1992 to include these important aspects of forestry. The salient features of the National Forestry Policy, 1978 (Revised 1992) are as shown in **Appendix 2**.

4.10 Besides, various forest enactment and rules that were formulated and enforced by the respective state authorities since the early 1900s were found to be deficient and weak in areas of forest protection, management and planning, as well as in forest renewal operations which are vital to sustainable management and in the protection of environmental stability and ecological balance. To overcome these shortcomings and to ensure the effective implementation of the National Forestry Policy, the NFC agreed to review, up-date and uniformize the existing State Forest Enactment, especially in Peninsular Malaysia. Hence, a National Forestry Act was formulated and passed by an Act of Parliament in October, 1984. This Act is now being enforced by all the State Forestry Departments in Peninsular Malaysia. Furthermore, to further strengthen its provisions to safeguard and protect the forest resources from encroachment and illegal logging, the Act was amended in 1993.

4.11 In this context, the penalty for the commission of any forest offence has been increased from the maximum penalty of US\$2,630 or an imprisonment for a term not exceeding three years or both to a maximum penalty of US\$131,580 and an imprisonment not exceeding 20 years with a mandatory imprisonment of at least one year. The amended National Forestry Act has also enacted provisions for the Police and Armed Forces to undertake surveillance of forestry activities, especially in curbing illegal logging, encroachment of forest areas and timber theft.

4.12 Furthermore, under section 10 (1) of the National Forestry Act, 1984, all the State Forestry Departments in Peninsular Malaysia have also further classified the PFE into one or more of the following functional use classes through a combination of slope and elevation classes:-

- (i) timber production forest under sustained yield;

- (ii) soil protection forest;
- (iii) soil reclamation forest;
- (iv) flood control forest;
- (v) water catchment forest;
- (vi) forest sanctuary for wildlife;
- (vii) virgin jungle reserved forest;
- (viii) amenity forest;
- (ix) education forest;
- (x) research forest; and
- (xi) forest for federal purposes.

## 5.0 **FOREST HARVESTING**

5.1 Forest harvesting in the inland forest in Malaysia is generally carried out by a combination of crawler tractor-winch lorry. Under this harvesting system the crawler tractor skids the logs from the felling sites to the skid trails where the winch lorry continues the transportation to the roadside landings. In Malaysia, the skidder generally does not pick up its load from the felling site because of adverse soil and terrain conditions. Currently, reduced impact logging (ground skidding) is also being carried out in a few forest areas in Peninsular Malaysia and in the state of Sabah, while low impact logging (helicopter logging) is being carried out in the state of Sarawak.

5.2 It has been estimated that the costs of extraction of logs to log landing under helicopter logging range from US\$50 - US\$60/m<sup>3</sup>, while that for conventional tractor logging is estimated to be US\$10 - US\$13/m<sup>3</sup>. Although the cost of helicopter logging is relatively much higher than the conventional crawler tractor-winch lorry system, the harvesting damage to surrounding trees is found to be 3.8 times lower than the conventional system. Soil erosion resulting from forest road construction is also minimized as a result of the 3 km flying range of the helicopter as compared to the optimum skidding distance of 1 km for the tractor.

5.3 To further mitigate the adverse effects of forest harvesting, the Forestry Departments have also adopted standard road specifications and forest harvesting guidelines for strict adherence by all logging contractors both at the planning and implementation levels. All harvesting operations have to be carried out in accordance with these specifications and guidelines, particularly those pertaining to road construction, alignment, gradient, drainage, tree marking, direction of felling and the setting up of log-yards. The Departments' role is to supervise closely the implementation of the environmental conservation measures such as the choice of machinery, construction of water bars, silt traps and the control of pollution of rivers and waterbodies resulting from logging. The forest engineers of the Forestry Departments play an active role in providing technical advice and services on all matters pertaining to infrastructural development of the logging sector, such as the design and construction of forest roads so as to enhance environmental stability and quality.

## 6.0 **FORMULATION OF CRITERIA AND INDICATORS**

### (a) *Overview*

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6.1 Malaysia as a producer member country of the International Tropical Timber Organization (ITTO) is fully committed to achieve sustainable forest management in the overall context of sustainable development. Implicit to this commitment is the acceptance of the ITTO definition on sustainable forest management which is defined as *a process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity, and without undue undesirable effects on the physical and social environment.*

6.2 For the purpose of this paper, a Forest Management Unit is defined as an area of forest land that is managed by an organizational entity which decides on and subsequently implements forest activities to ensure the economic, ecological, biological and socio-cultural sustainability of the area. The area being managed may be owned by an individual or several individuals grouped together or by a community within a single administrative boundary, all under a specific forest management plan within which forest activities are regulated by a national or state forest service. The size of the unit should be large enough to yield economic harvests in terms of public revenue and private profits, and to provide for the conservation of key wildlife species. In general, the unit consists of forest districts having a number of forest reserves, which are further divided into compartments and sub-compartments for the purpose of effective management, conservation and development of the forest resources.

6.3 Currently, each individual state, especially in Peninsular Malaysia, is defined as a forest management unit in view of the following legal and administrative requirements:-

- (i) as mentioned earlier, under Article 74 (2) of the Malaysian Constitution, forestry comes under the jurisdiction of the respective State Governments. As such, each state is empowered to enact laws on forestry and to formulate forestry policy independently. The executive authority of the Federal Government only extends to the provision of advice and technical assistance to the states, training, the conduct of research and maintenance of experimental and demonstration stations;
- (ii) the implementation of criteria, indicators and activities, as well as management prescriptions and standards of performance are monitored and evaluated at the state level by the Federal agencies and bodies, such as the National Forestry Council;
- (iii) all the decisions made with regard to the implementation of forest management, conservation and development activities in the state are carried out at the state level by the respective State Authorities;

- (iv) the allocation of Annual Allowable Cuts (AACs) for the production forests of the PFE by the National Forestry Council is determined on a state by state basis; and
- (v) under section 4 of the National Forestry Act, 1984, each Director of the State Forestry Department is responsible to the State Authority for the preparation and implementation of the State forest management plan, reforestation plan and programs relating to amenity forests.

6.4 In 1994, a *National Committee on Sustainable Forest Management in Malaysia* comprising representatives from the Ministry of Primary Industries, Malaysia; the Forestry Departments of Peninsular Malaysia, Sabah and Sarawak; the Forest Research Institute, Malaysia; the Malaysian Timber Industry Board; the Malaysian Timber Council and the Faculty of Forestry, University Putra Malaysia was established at the Ministry to elaborate and operationalize the ITTO's *Guidelines for the Sustainable Management of Natural Tropical Forests* and its *Criteria for the Measurement of Sustainable Tropical Forest Management* for managing its natural forest and to ensure it is sustainable managed. To further support the Committee's work, the ten State Forestry Departments in Peninsular Malaysia had also formed a *Working Party on Sustainable Natural Management, Peninsular Malaysia* at the Forestry Department Headquarters, Peninsular Malaysia in February, 1994.

(b) *National Level*

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6.5 After a series of meetings, the Committee had formulated a total of 92 activities to operationalize the ITTO's 5 criteria and 27 indicators on sustainable forest management at the national level, covering the *forest resource base, continuity of flow, level of environmental control, socio-economic effects and institutional frameworks*.

6.6 In the process, the Committee had added two additional indicators, while omitting two of the proposed ITTO's indicators. The two additional indicators were the indicator on *Plantation Establishment of Non-wood Forest Produce and Annual Planting Targets* under the ITTO's criterion on the *Forest Resource Base* and the indicator on *Expenditure Budgets for Forest Administration* under the ITTO's criterion on *Socio-economic Effects*. The reason for omitting the ITTO's indicator on *Availability of Environmental Assessment Procedures* under the criterion *Socio-economic Effects* was that this indicator was also included under the criterion on the *Level of Environmental Control* which the Committee deemed to be more appropriate, while the omission of the indicator on the *Relationship of National Policy to ITTO Guidelines* under the criterion on *Institutional Frameworks* was that the National Forestry Policy of Malaysia had adequately met the objectives of the ITTO guidelines in terms of sustainable forest management.

(c) *Forest Management Unit Level*

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6.7 At the forest management unit level, the Committee had identified a total of 84 activities to be implemented under the 6 criteria of the ITTO and its 23 indicators, covering *resource security, the continuity of timber production, conservation of flora and fauna* and other forest resources, *an acceptable level of environmental impact,*

*socio-economic benefits, and planning and adjustment to experience.* In its development, the Committee had added seven additional indicators from those identified at the national level to this level which are as follows:-

- (i) the length of cutting cycle;
- (ii) areas of Protection Forests and Production Forests within the PFE;
- (iii) establishment of forest plantations for wood production;
- (iv) establishment of forest plantations for non-wood production;
- (v) availability of environmental assessment procedures;
- (vi) expenditure budgets for forest management; and
- (vii) expenditure budgets for forest administration.

6.8 Moreover, in Peninsular Malaysia, against each of the activities identified at the national and forest management unit levels, the respective State Forestry Departments had also formulated management specifications (benchmarks) for its effective monitoring and evaluation. A total of 206 and 191 management specifications have been formulated at the national and forest management unit levels respectively. The number of criteria, indicators, activities and management specifications formulated at the national and forest management unit levels are as shown in **Appendices 3 and 4** respectively.

## 7.0 **REVISION OF CRITERIA AND INDICATORS**

7.1 With the adoption of the new ITTO documents on *Criteria and Indicators for Sustainable Management of Natural Tropical Forests* and the *Manual for the Application of Criteria and Indicators for Sustainable Management of Natural Tropical Forests (Part A – National Indicators and Part B – Forest Management Unit Indicators)* at the 24<sup>th</sup> Session of the International Tropical Timber Council (ITTC) held from 20-28 May, 1998 in Libreville, Gabon and the 26<sup>th</sup> Session held from 28 May – 3 June, 1999 in Chiang Mai, Thailand respectively; Malaysia had taken action to revise its MC&I which was formulated based on the earlier guidelines of the ITTO, and in particular, the ITTO's *Criteria for the Measurement of Sustainable Tropical Forest Management*.

7.2 The revision of the MC&I was co-ordinated by the Malaysian Timber Certification Council (MTCC) through a preliminary meeting held among the Forestry Departments of Peninsular Malaysia, Sabah and Sarawak in July, 1999 to agree on a common set of Criteria and Indicators for Sustainable Forest Management for the whole country, both at the national and forest management unit levels, based on the ITTO's *Criteria and Indicators for Sustainable Management of Natural Tropical Forests*, as well as the Activities required to operationalize these criteria and indicators which were based on the 'Action To Be Taken' as contained in the ITTO's *Manual for the Application of Criteria and Indicators for Sustainable Management of Natural Tropical Forests (Parts A and B)*.

7.3 This was followed by regional consultations with interested parties to identify appropriate Standards of Performance for each of the Activities. These consultations were conducted by the Forestry Departments of Peninsular Malaysia, Sabah and



Sarawak in their respective regions in August, 1999. In the case of Peninsular Malaysia it entails the refinement and/or addition to the Management Specifications of the MC&I formulated earlier in 1994. These regional Standards of Performance were then integrated into the draft MC&I for the whole country through a meeting held between the three Forestry Departments of Peninsular Malaysia, Sabah and Sarawak which was co-ordinated by the MTCC in September, 1999.

7.4 The draft MC&I was then tabled at the national-level consultation held in October, 1999 where a total of 85 organizations and companies, representing interested parties such as the timber industry, social and environmental non-governmental organizations, trade unions, women's organization, academic/research institutions and government agencies, were invited to attend. In this regard, a total of 111 participants representing 58 organizations, including two representatives from the Forest Stewardship Council participated. Through this open and transparent process, Malaysia had adopted a set of MC&I for assessing forest management practices in all forest management units under the MTCC's scheme for forest management certification in the overall context of timber certification and products labelling, which is currently being developed.

7.5 In this regard, under the 7 criteria of the ITTO, a total of 64 indicators and 200 activities were formulated at the national level; while 7 criteria, 56 indicators and 171 activities were formulated for assessing sustainable forest management at the forest management unit level. Furthermore, Peninsular Malaysia had also developed a total of 170 and 150 standards of performance to assess the implementation of the 200 and 171 activities formulated at the national and forest management unit levels respectively. The number of criteria, indicators, activities and standards of performance formulated for sustainable forest management at the national and forest management unit levels, in the revised MC&I, are as shown in **Appendices 5 and 6** respectively.

7.6 In the process of revising the MC&I, Malaysia has added the following three items to the ITTO's indicators at both the national and forest management unit levels:-

- (i) an element on **rights of forest workers** to the ITTO's Indicator 1.1 – Existence of a framework of laws, policies and regulations under Criterion 1 – Enabling Conditions for Sustainable Forest Management;
- (ii) an item on **mortality rate** to the ITTO's Indicator 7.8 - Employment in the forestry sector under Criterion 7 – Economic, Social and Cultural Aspects; and
- (iii) the words '**and competency**' to the ITTO's Indicator 1.5 – Number and adequacy of trained professional and technical personnel at all levels to perform and support management, implementation, research and extension also under Criterion 1 which now reads as Number, and adequacy and competency of trained professional and technical personnel at all levels to perform and support management, implementation, research and extension.

7.7 Malaysia has also addressed the gender issue in the ITTO's *Indicator 1.5* and *Indicator 7.8* at both the national and forest management unit levels. Besides, for *Indicator 1.5*, the information on *Research and Extension* will be recorded separately

instead of as one category as suggested by the ITTO, again at both the national and forest management unit levels. This will be reviewed and revised following the adoption of the *Reporting Formats for ITTO Criteria and Indicators for Sustainable Management of Natural Tropical Forests* (Reporting Questionnaire for Indicators at the National and Forest Management Unit Levels) at the 30<sup>th</sup> Session of the ITTC held in Yaounde, Cameroon from 28 May – 2 June, 2001.

7.8 For the MC&I for sustainable forest management at the forest management unit level, Malaysia has also included the following seven additional indicators/items from those proposed by the ITTO to be used only at the national level to this level:-

- (i) ITTO's Indicator 1.1 – Existence of a framework of laws, policies and regulations;
- (ii) the item on *the Bali Partnership Fund* in ITTO's Indicator 1.2 – Amount of investment and reinvestment in forest management, administration, research and human resource development;
- (iii) ITTO's Indicator 5.1 – Statistics of protected areas in each forest type;
- (iv) ITTO's Indicator 5.2 – Percentage of total number of protected areas connected by biological corridors or 'stepping stones' between them;
- (v) ITTO's Indicator 7.4 – Ratio of domestic log production to the processing capacity of wood-based industries;
- (vi) the items on *percentage of total work force* and *average wage rate* in the ITTO's Indicator 7.8 – Employment in the forestry sector; and
- (vii) the items on *research* and *education* in the ITTO's Indicator 7.9 – Number and extent of forest sites available.

7.9 However, Malaysia has omitted two of the ITTO's indicators from the MC&I at both the national and forest management unit levels. These are as follows:-

- (i) ITTO's Indicator 7.3 – Quantity (volume) and value of wood and non-wood forest products for subsistence use, including fuelwood, as the use of wood and non-wood forest products for subsistence use is insignificant in Malaysia and has a very negligible impact on its overall economy; and
- (ii) ITTO's Indicator 7.18 – Number of agreements involving local communities in co-management responsibilities, as currently co-management agreements are not practised in Malaysia, especially in forest harvesting.

7.10 Furthermore, Malaysia has also omitted four indicators/items at the forest management unit level although they have been proposed by the ITTO, as follows:-

- (i) ITTO's Indicator 5.5 – Percentage of original range occupied by selected endangered, rare and threatened species, as this indicator is best

reflected at the national level in view that the protection of selected endangered, rare and threatened species is a national responsibility;

- (ii) the item on *ex situ* conservation in the ITTO's Indicator 5.6 – Existence and implementation of a strategy for *in situ* and/or *ex situ* conservation of the genetic variation within commercial, endangered, rare and threatened species of forest flora and fauna, as this is deemed to be best covered and implemented at the national level;
- (iii) ITTO's Indicator 7.2 – Quantity (volume) and value of wood and non-wood forest products traded in the domestic and international markets, as all relevant data on trade of wood and non-wood forest products are collected at the national level; and
- (iv) ITTO's Indicator 7.5 – Efficiency of utilization in terms of the percentage of felled volume processed, as all relevant data are collected at the national level.

## 8.0 **MONITORING, ASSESSING AND REPORTING**

8.1 The primary purpose of using criteria and indicators is to enable countries to assess their progress towards sustainable forest management in an organized and systematic manner. In this regard, it is important to address criteria and indicators at both the national and management unit levels as criteria and indicators at the national level only provide a common framework for monitoring, assessment and reporting progress towards sustainability at the national level, but do not specify requirements for sustainable forest management practices in the field; while the indicators at the forest management unit level are intended to assess directly the sustainability of forest resource management, conservation and development at that level.

8.2 In Malaysia, the criteria, indicators, activities, management prescriptions and standards of performance at the national level will be used for reporting its progress towards achieving sustainable forest management, and in particular, the ITTO Year 2000 Objective. Those formulated at the forest management unit level would be used by the Forestry Departments to monitor and assess progress towards the attainment of sustainable forest management at the field level, and for undertaking forest management certification by independent third party assessors in the overall context of timber certification and products labelling.

8.3 In order to ensure that the agreed activities are implemented in the field by the respective State Forestry Departments in Malaysia, a *Task Force* comprising representatives from the Ministry of Primary Industries, Malaysia; the Forestry Departments of Peninsular Malaysia, Sabah and Sarawak; the Forest Research Institute, Malaysia; the Malaysian Timber Industry Board; the Malaysian Timber Council and the Faculty of Forestry, University Putra Malaysia was established in May, 1995. To complement this effort, Peninsular Malaysia had also formed a *Technical Monitoring Committee* at the Forestry Department Headquarters, Peninsular Malaysia in October, 1995 to monitor the implementation of all the activities undertaken by the respective State Forestry Departments in Peninsular Malaysia.

8.4 The Task Force would develop an effective mechanism and procedures for the periodic monitoring on the implementation of all the activities, and produce reports on their progress to the higher authorities in Malaysia for their information and further action.

8.5 In this context, Malaysia has developed internal assessment procedures for monitoring and evaluating sustainable forest management based on the MC&I. This was jointly undertaken with the support of the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) of Germany in 1999 and is now fully operational.

8.6 However, a phased approach was adopted to realize the full application of criteria and indicators for sustainable forest management, at both the national and forest management unit levels, as there are still inadequate knowledge and/or data to enable the formulation of management prescriptions and operational guidelines, as well as their respective standards of performance for a number of indicators in the MC&I for effective monitoring and assessment. These are follows:-

- (i) ITTO's Indicator 4.2 – Estimate of level of sustainable harvest for each main wood and **non-wood forest product** for each forest type;
- (ii) ITTO's Indicator 4.3 – Quantity (volume) of wood and important **non-wood forest products** harvested for each forest type;
- (iii) ITTO's Indicator 4.8 – Availability and implementation of management guidelines for each of the main wood and **non-wood forest products** to be harvested;
- (iv) ITTO's Indicator 5.2 – Percentage of total number of protected areas connected by biological corridors or 'stepping stones' between them;
- (v) ITTO's Indicator 5.4 – Number of endangered, rare and threatened forest-dependent species;
- (vi) ITTO's Indicators 5.5 – Percentage of original range occupied by selected endangered, rare and threatened species;
- (vii) ITTO's Indicators 5.8 –Existence and implementation of procedures for assessing changes of biological diversity of the production forests, compared with areas in the same forest type kept free from human intervention;
- (viii) ITTO's Indicator 6.2 – Extent and percentage of area to be harvested for which off-site catchment values have been defined, documented and protected before harvesting;
- (ix) ITTO Indicator 6.4 – Extent and percentage of area to be harvested for which drainage systems have been demarcated or clearly defined and protected before harvesting;
- (x) ITTO's Indicator 6.9 – Existence and implementation of procedures for assessing changes in the water quality of streams emerging from

production forests as compared with streams emerging from the same forest type kept free from human intervention;

(xi) ITTO's Indicator 7.6 – Existence and implementation of mechanisms for the effective distribution of incentives and the fair and equitable sharing of costs and benefits among the parties involved; and

(xii) ITTO's Indicator 7.13 – Total amount of carbon stored in forest stands.

8.7 Following this phased approach, Peninsular Malaysia had identified a sub-set of the MC&I for forest management certification undertaken by an independent third party assessor in the overall context of timber certification and products labelling. This will enable the certified timber products to enter the Keurhout Hallmark System of The Netherlands as this sub-set of MC&I has met the Dutch Minimum Requirements for timber certification.

8.8 In this regard, a total of 29 indicators, 87 activities and 49 standards of performance under 6 criteria of the MC&I were used to assess forest management practices in the states of Selangor, Pahang and Terengganu under the Malaysia-Netherlands timber certification arrangement in the middle of last year, and for the states of Johor, Kedah, Perak and Negeri Sembilan in October/November this year.

## 9.0 **LESSONS LEARNED**

9.1 It should be stressed that criteria and indicators are not an end in themselves. Their importance for countries is two-fold – to assist in the identification of the elements that constitute sustainable forest management; and to make it possible to monitor and evaluate progress towards that national goal. At the international level, they should be a useful tool for reporting the state of the nation's forests to ITTO and other international fora, including the United Nations Forum on Forests (UNFF).

9.2 It is also important to address criteria and indicators at both the national and forest management unit levels for a number of reasons. First, the overall sustainability of the management of a nation's forests depends substantially upon actions taken at the national level (such as legislation, land-use planning etc.). Secondly, the evaluation of sustainable forest management at the national level depends upon the quality of management of the aggregate of all forest management units. And, thirdly, if purchasers are to be satisfied that the product they buy comes from a well managed forest, this assurance must be supported by standards of performance, and therefore by indicators, applied at the level of the forest management unit.

9.3 Within these two broad classes (the national and the forest management unit), criteria and indicators fall into two categories which are different in kind. First, there are many that are technical in nature – they refer to *the state of the forest itself*, such as its extent, the quality of its management and the goods and services actually derived from it. Secondly, there are others which may be better described as *enabling conditions and mechanisms*; in the absence of these, sustainable forest management is unlikely to succeed. Examples are such institutional matters as sufficient qualified personnel and adequate research, sufficient financial resources and social considerations such as wide consultation.

9.4 The information generated through the use of criteria and indicators in assessing the state of the forests will help policy and decision-makers to communicate the status of sustainable forest management more effectively to the public. It will also assist in developing policies and strategies for sustainable forest management, acts as ingredients for the preparation of forest management plans, in focusing research efforts where knowledge is still lacking and deficient, and in identifying those areas which are in special need of international assistance and co-operation.

9.5 It is important to note that criteria and indicators by themselves cannot establish whether management is or is not sustainable. To do this, they must be supplemented by *standards of performance* and *management prescriptions* which must be determined by the countries themselves and may often, within countries, be specific to particular forest types. This is a prerequisite to any voluntary certification of forest products.

9.6 In some instances, important indicators may involve the gathering of new or additional information and new research. Furthermore, although it is desirable to have quantitative indicators that are easily measurable, some indicators of a given criterion are qualitative or descriptive in nature and may require experienced judgments as to what constitutes best forest management practice. It is intended that specific management specifications and prescriptions would have to be developed by individual countries for each of the indicators at both the national and forest management unit levels and be appropriate to the forest harvesting systems used (ground skidding, long distance cable crane yarding, aerial logging etc.), through which the standards of performance or acceptable levels of sustainable forest management could be ascertained. This is pertinent as differences in the development and implementation of national and forest management unit levels criteria and indicators depend on the particular conditions and the level of socio-economic development of each country, as well as existing cultural and traditional values, the regulatory framework and the structure of the forestry sector itself.

9.7 In this context, countries will have to take a focussed approach to implementing criteria and indicators. First, data on some indicators are readily available while others may require additional resources or even new research. Secondly, not all indicators are equally important to all countries because of different forest conditions and economic and social priorities. Decisions on priorities in implementing criteria and indicators will, of course, be made at the country level; and may involve a phased approach to fully realizing them. However, in the medium term it should give priority to the following areas:-

- (i) to adopt a forest policy and enforce legislation;
- (ii) to establish and secure a Permanent Forest Estate, as well as undertake zonation of the functional use classes of the Estate which may or may not be mutually exclusive;
- (iii) to reduce the damage caused by timber harvesting to the physical and social environments, and to the forest ecosystem;
- (iv) to train the work force to accelerate the use of reduced impact logging; and

- (v) to limit the harvest levels of timber to the sustained yield capacity where the annual volume removed be less than or equal to the mean annual increment (MAI) of the forest stand.

9.8 In the longer term, research and studies will have to be conducted to address the following aspects:-

- (i) the level of sustainable harvest of non-wood forest products, including the formulation and implementation of their respective management guidelines;
- (ii) the connectivity of protected areas by biological corridors or ‘stepping stones’ between them; and the number of endangered, rare and threatened species of forest flora and fauna, and in particular, forest flora;
- (iii) the changes in biological diversity and water quality of streams of the production forests after forest harvesting, and their long-term effects on the integrity of the forest ecosystem;
- (iv) the mechanisms for the effective distribution of incentives and the sharing of costs and benefits among the parties involved in managing the forest resources, including addressing the issue of intergenerational equity;
- (v) the quantity and value of wood and non-wood forest products for subsistence use; and
- (vi) the amount of carbon sequestered and stored in forest stands and by forest types.

9.9 The full implementation of the MC&I, elaborated and adopted from the *ITTO Criteria and Indicator for Sustainable Management of Natural Tropical Forests*, in monitoring, assessing and reporting of progress towards the attainment of sustainable forest management in Malaysia would have addressed all the Intergovernmental Panel on Forests (IPF) and the Intergovernmental Forum on Forests (IFF) Proposals for Action involving the management, conservation and sustainable development of forest resources, except for the clusters of Proposals of Action covering:-

- (i) the work of multilateral and international organizations, financial institutions, and governing bodies of instruments that address forest and forest-related matters;
- (ii) the application of forest-related knowledge, including its protection, among others, against international trafficking, payment for its use, and the issue of intellectual property rights;
- (iii) the effect of trans-boundary air pollution on forest health and the development of criteria and indicators for national assessment and monitoring of airborne pollutants;

- (iv) the valuation of all forest goods and services, including ways to internalize externalities, such as macroeconomic structural adjustment programs and the impact of poverty;
- (v) the provision of new and additional financial resources by international and regional organizations, financial lending institutions and donor countries, as well as the transfer of environmentally sound technologies and know-how to enhance sustainable forest management, especially to developing countries; and
- (vi) the impact of trade-related measures on sustainable forest management, such as greater market access and transparency, substitution effect by non-renewable wood products, tariff and non-tariff barriers to trade, and the application of voluntary certification and labelling schemes that are credible and cost-effective, as well as to promote their equivalency and mutual recognition.

## 10. **CONCLUSIONS**

10.1 The criteria and indicators developed for assessing sustainable forest management in Malaysia will be reviewed and refined periodically to reflect new concepts of sustainable forest management. This will be based on evolving knowledge about the functioning of forest ecosystem, anthropogenic intervention on the forests whether planned or unplanned and the changing needs of society for forest goods and services. Besides, the capability to formulate indicators will increase and scientific knowledge will improve about the nature of 'best' indicators to assess sustainability of the forest resources.

10.2 Furthermore, the level of management at the forest management unit level in Malaysia will also be refined once the current silvicultural management systems are further developed for application at a lower management level, perhaps at the forest district level, forest reserve level or even at the compartment level. In this connection, the GTZ project on *Sustainable Forest Management and Conservation in Peninsular Malaysia* which is involved in the refinement of the current forest management systems, the improvement of silvicultural practices and the development of a cost-effective forest planning system for application at the operational level would greatly enhance this effort.

10.3 While there is no denying that there are still some outstanding issues remain unresolved, nevertheless, given the constraints, Malaysia has certainly not been side-stepping conservation and environmental issues in managing and developing its forest resource. This renewable asset will continue to be managed in accordance with national objectives and priorities so that the country will continue to enjoy the benefits generated from the forest and forest industries.

10.4 The long-term viability for the sound and sustainable development, management and conservation of the forest resource in Malaysia will be one that balances the needs of the economy, environment and ecology.



**Table 1: Distribution and Extent of Major Forest Types in Malaysia, 2000  
(million ha)**

Region	Land Area	Dipterocarp Forest	Swamp Forest	Mangrove Forest	Plantation Forest	Total Forested Land	Percentage Total of Forested Land
Peninsular Malaysia	13.16	5.50	0.30	0.11	0.07	5.98	45.4
Sabah	7.37	3.41	0.12	0.34	0.15	4.02	54.5
Sarawak	12.30	8.64	1.04	0.13	0.03	9.84	80.0
Malaysia	32.83	17.55	1.46	0.58	0.25	19.84	60.4

**Table 2: Permanent Forest Estate in Malaysia, 2000  
(million ha)**

Region	Protection Forest	Production Forest	Total Land Area Under PFE	Percentage of Total Land Area
Peninsular Malaysia	1.90	2.94	4.84	36.8
Sabah	0.91	2.69	3.60	48.8
Sarawak	1.03	4.97	6.00	48.8
Malaysia	3.84	10.60	14.44	44.0

**Table 3: Area Under National Parks, Wildlife and Bird Sanctuaries in Malaysia, 2000  
(million ha)**

Region	National Park	Wildlife and Bird Sanctuary	Total
Peninsular Malaysia	0.43	0.31+	0.74
Sabah	0.25	0.16++	0.41
Sarawak	0.70*	0.30**	1.00
Malaysia	1.38	0.77	2.15

\* Includes 0.57 million ha of proposed national parks.

\*\* Includes 0.14 million ha of proposed wildlife sanctuaries.

+ A total of 0.19 million ha is located within the PFE of Peninsular Malaysia.

++ A total of 0.13 million ha is located within the PFE of Sabah.

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- (i) To dedicate as **PERMANENT FOREST ESTATE** sufficient areas strategically located throughout the country in accordance with the concept of rational land use, which will be managed and classified under four major functions, namely:-
- \* **PROTECTION FOREST** for ensuring favourable climatic and physical conditions of the country, the safeguarding of water resources, soil fertility and environmental quality, the conservation of biological diversity and the minimization of damage by floods and erosion to rivers and agricultural lands;
  - \* **PRODUCTION FOREST** for the supply in perpetuity, at reasonable costs of all forms of forest produce which can be economically produced within the country and are required for agricultural, domestic and industrial purposes, and for export;
  - \* **AMENITY FOREST** for the conservation of adequate forest areas for recreation, ecotourism and in enhancing public awareness in forestry; and
  - \* **RESEARCH AND EDUCATION FOREST** for the conduct of research and education.
- (ii) To implement a planned program of forest development through forest regeneration and rehabilitation operations in accordance with prescribed silvicultural practices.
- (iii) To promote efficient harvesting and utilization within the production forest for maximum economic benefits from all forms of forest produce and to stimulate the development of appropriate forest industries commensurate with the resource flow, as well as to create employment opportunities.
- (iv) To increase the production of non-wood forest produces through scientific and sustainable management practices to meet local demands and related industries.
- (v) To provide for the conservation of biological diversity and areas with unique species of flora and fauna.
- (vi) To encourage private sector investment in forest development through the establishment of forest plantation.

- (vii) To undertake and support intensive research programs in forestry and forest products aimed at enhancing maximum benefits from the forest.
- (viii) To undertake and support a comprehensive program of forestry training at all levels for the public and private sectors in order to ensure adequate supply of trained manpower to meet the requirements of the forest sector and the forest-based industries.
- (ix) To promote education in forestry and undertake publicity and extension services in order to generate better understanding among the community of the multiple values of forest.
- (x) To set aside specific areas for the purpose of forestry education and other scientific studies.
- (xi) To promote active local community participation in various forestry development projects and to enhance their involvement in agro-forestry programs.
- (xii) To develop a comprehensive program in community forestry to cater for the needs of the rural and urban communities.

### **Appendix 3**

#### **Criteria, Indicators, Activities and Management Specifications for Sustainable Forest Management at the National Level**

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<b>Criteria</b>	<b>Indicators</b>	<b>Activities</b>	<b>Management Specifications+</b>
A. The Forest Resource Base	6	21	64
B. The Continuity of Flow	8	33	89
C. The Level of Environmental Control	3	10	20
D. Socio-economic Effects	4	12	12
E. Institutional Frameworks	6	16	21
<b>Total: 5</b>	<b>27</b>	<b>92</b>	<b>206</b>

+ For Peninsular Malaysia only.

### **Appendix 4**

#### **Criteria, Indicators, Activities and Management Specifications for Sustainable Forest Management at the Forest Management Unit Level**

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<b>Criteria</b>	<b>Indicators</b>	<b>Activities</b>	<b>Management Specifications+</b>
A. Resource Security	8	23	53
B. The Continuity of Timber Production	9	24	59
C. The Conservation of Flora and Fauna <i>and other Forest Resources</i>	2	8	27
D. An Acceptable Level of Environmental Impact	5	12	27
E. Socio-economic Benefits	4	14	21
F. Planning and Adjustment to Experience	2	3	4
<b>Total: 6</b>	<b>30</b>	<b>84</b>	<b>191</b>

+ For Peninsular Malaysia only.

## **Appendix 5**

### **Criteria, Indicators, Activities and Standards of Performance for Sustainable Forest Management at the National Level in the Revised MC&I**

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<b>Criteria</b>	<b>Indicators</b>	<b>Activities</b>	<b>Standards of Performance+</b>
1. Enabling Conditions for Sustainable Forest Management	9	31	20
2. Forest Resource Security	5	22	17
3. Forest Ecosystem Health and Condition	5	20	13
4. Flow of Forest Produce	12	37	31
5. Biological Diversity	8	25	22
6. Soil and Water	9	26	29
7. Economic, Social and Cultural Aspects	16	39	38
<b>Total: 7</b>	<b>64</b>	<b>200</b>	<b>170</b>

+ For Peninsular Malaysia only.

## **Appendix 6**

### **Criteria, Indicators, Activities and Standards of Performance for Sustainable Forest Management at the Forest Management Unit Level in the Revised MC&I**

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<b>Criteria</b>	<b>Indicators</b>	<b>Activities</b>	<b>Standards of Performance+</b>
1. Enabling Conditions for Sustainable Forest Management	8	26	17
2. Forest Resource Security	5	22	17
3. Forest Ecosystem Health and Condition	3	12	9
4. Flow of Forest Produce	12	37	31
5. Biological Diversity	7	21	18
6. Soil and Water	9	26	29
7. Economic, Social and Cultural Aspects	12	27	29
<b>Total: 7</b>	<b>56</b>	<b>171</b>	<b>150</b>

+ For Peninsular Malaysia only.