

The Role of Forestry Research and Development (R&D) Institution in Policy Formulation and Implementation: A Malaysian Perspective

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ABSTRACT

Decisions that are made in any field of interest will in one way or another affect the society, be they at the local or international level. Regardless of whether the decisions are intended for sustainable development of the nation's economic growth or something else, the ripple effects will definitely affect the society in both short and long terms. The effects sometimes are positive but at other times negative. The negative effects are the ones that policy-makers would like to avoid, if not lessen to a certain extent. In Peninsular Malaysia, the former Forest Research Institute (FRI) was a unit under the Department of Forestry Peninsular Malaysia. Subsequently, in 1985, FRI was instituted as a statutory body now called the Forest Research Institute Malaysia (FRIM), reporting directly to the Ministry of Primary Industries and now to the Ministry of Natural Resources and Environment (NRE). In the former structure under the Forestry Department of Peninsular Malaysia, a major disadvantage was that not all pertinent issues related to forestry reached the institute. This resulted in FRI's having a limited influence on decision-making at the national level. As a separate entity reporting directly to the Ministry, FRIM is now able to contribute more effectively to the formulation and implementation of forest-related policies. This paper, therefore, not only sheds light on the organizational structure usually associated with forestry research and development (R&D) institutions, but also examines how such an organizational structure can contribute more positively to the formulation and implementation of forest policies.

INTRODUCTION

An individual country's forest policy and its implementation may be seen as a localized subject matter if their impact is viewed as affecting only the local community. For instance, a forest policy on harvesting of logs may be drawn at the federal level, whereas its implementation is under the jurisdiction of the local state government. Since forest harvesting directly affects the local dependent community, not to mention a chain of other goods and services, the need to continuously manage the forest in a sustainable manner is crucial. Stated differently, harvesting may be seen as a localized activity, but its effects, especially on the

environmental functions of the forest, such as carbon sequestration, conservation of biological resources and other related functions, actually are borderless. To ensure that the implementation of forest policies does not jeopardize the existing goods and services provided by the forests, the formulation of such policies must consider all stakeholders who will be directly affected by the decisions. The stakeholders in this context include the local community, the society at large, planners, decision-makers, implementers (i.e. forest managers), non-governmental organizations (NGOs) and others who may have direct and indirect interests in the subject matter.

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Together with these stakeholders, the research community also has an important role in decision-making on matters related to forestry. The importance of the contribution of a research and development (R&D) institution through its research activities in formulating and implementing forestry matters cannot be denied. Even though, at times, the R&D institution does not have a direct say in matters related to forestry, research inputs from such an organization are crucial in decision-making. Based on scientific evidence from research findings, the decisions made are more realistic and acceptable. What is important at this juncture is to determine whether and to what extent research findings have influenced decisions related to forestry matters. Above all, if linkages already exist among researchers, stakeholders, and policy-makers, could the tie be further improved to ensure that the decisions that are made benefit the stakeholders?

The current organizational structure has improved the role of the R&D institution, such as the Forest Research Institute Malaysia (formerly known as the Forest Research Institute (FRI)), in contributing to the overall formulation and implementation of forest policies in Malaysia. Under the current organizational structure, the Forest Research Institute Malaysia (FRIM) is now able to contribute more positively toward all issues pertaining to forestry matters. Nonetheless, before discussing the various advantages of the current organizational structure, it is worthwhile to review the situation that existed when FRIM was one of the units under the Department of Forestry Peninsular Malaysia. Such an experience can be considered a lesson to be learned by other R&D institutions to ensure their active participation in decision-making regarding forest policies.

This paper examines the past and current organizational structures of FRIM as a research institution. It also suggests various means to encourage a more proactive role in formulating and implementing forest policies. In examining FRIM's organizational structure, the development of forest policies and other related issues will also be discussed.

THE ORGANIZATIONAL STRUCTURE— PAST AND PRESENT

As in most developing countries, Malaysia's research entities in the past always were part and

parcel of a larger organizational structure. At first, FRIM was only a unit under the organizational structure of the Department of Forestry Peninsular Malaysia (*Fig. 1*). Different from other units, FRI in the early days and until 1984 was directly responsible to the Deputy Director-General of Research and Industrial Development. At that time, the Department of Forestry Peninsular Malaysia was directly answerable to the Ministry of Primary Industries, Malaysia.

If one were to trace the development of the Department of Forestry Peninsular Malaysia one would find that the concept of establishing the department started way back in 1883. It was only in 1901 that the Department of Forestry Peninsular Malaysia was officially set up with the appointment of the first Chief Forest Officer (Forest Department Peninsular Malaysia 2003). Historical records also show that the Forest Research Institute was initiated in 1918 with the appointment of a Forest Research Officer in Peninsular Malaysia (known formerly as Malaya). In 1985, FRI became a statutory body and its name was changed to FRIM. A similar structure is also reported to exist in India, except that the forest research institute there started slightly earlier than the one in Malaya, i.e. in 1906 (Sharma, 2002). According to Sharma, the forest research institute in India was formerly under the control of the Ministry of Agriculture/Ministry of Environment and Forests and became a full-fledged research institute in 1986, i.e. a year later than FRIM.

Disadvantages of the Earlier Organizational Structure

There were disadvantages of being under the earlier organizational structure and the following points are worth mentioning.

First, being such a small unit among larger units under the Department of Forestry Peninsular Malaysia indeed limited FRI's capacity and capability to engage in large-scale R&D projects. Research conducted by FRI in the early days was focused on testing aspects of various timber species, such as their physical properties, seasoning qualities, woodworking characteristics, durability and amenability to preservative treatment. In short, FRI then was solely a timber research laboratory. A revised research programme based on that of the New Zealand Forest Service was published in 1954 (Federation of Malaya 1948). With the revised programme,

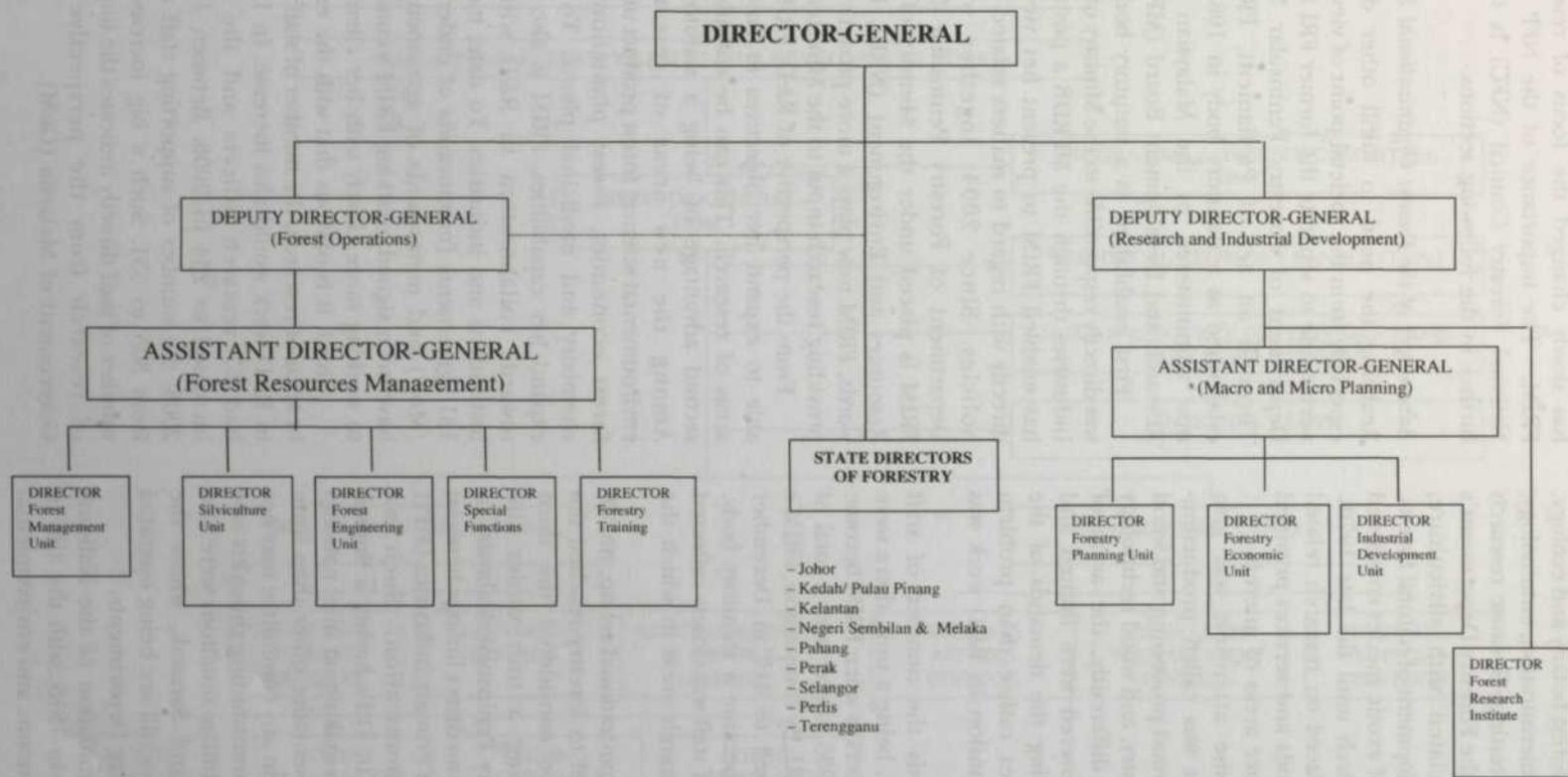


Fig. 1: Organization of the Forestry Department, Peninsular Malaysia, Ministry of Primary Industries, Malaysia (1980)
 Source: Forestry Department Peninsular Malaysia (1980)

the research focus was expanded to encompass other fields, including forest botany and ecology, soil and ecology, forest mensuration, entomology, chemistry and timber testing. Because research was part and parcel of the Forestry Department's activities, work associated with silviculture, regeneration and development of natural forests, and the introduction of exotic species continued to dominate the research until the late 1970s. Little emphasis was placed on research related to the community, goods and services provided by the forests, and other areas of interest.

Nevertheless, some attention was also directed towards what was called production-oriented research on wood processing and wood products, wood chemistry, and wood technology and fibre. To say it differently, the areas of research that were covered were limited and were geared to fulfilling the demands of the timber-based industries rather than problem solving. As such, expansion in R&D work was slow and restricted.

Second, as regards the number of staff engaged in R&D work, being a unit, there were not as many staff members as when FRIM became a statutory body. In 1985, there were a total of 372 staff members in FRI. By comparison, FRIM's staff members increased to 410 in December 1986, a year after it became a statutory body. The smaller number of staff was closely reflected in the number of research areas in which the institute was involved.

Because of the organizational set-up, not all pertinent issues related to forestry reached the institute. This can be considered the third disadvantage of being a unit under the Department of Forestry Peninsular Malaysia. In other words, there was no direct linkage between FRI and the Ministry of Primary Industries (MPI) in terms of communication. Such an arrangement resulted in FRI's having a limited influence on decision-making at the national level. To have a representative other than from FRI's own staff sitting on any committee may not be an effective way of transmitting thoughts and ideas on R&D work. Similar situations were also observed for Sabah and Sarawak, where the Forest Research Centres still are being operated under the State Forestry Departments.

However, the formulation of the National Forestry Policy (NFP) in 1978, with the aim of maximizing social, economic and environmental

benefits from the permanent forest estates (PFE), has slowly changed the focus of research in FRIM. The importance of the NFP and the National Forestry Council (NFC) is discussed further in the following sections.

Advantages of the Present Organizational Structure

Realizing the need to fulfill other demands, especially from the societal point of view, efforts were made to separate the former FRI from the Department of Forestry Peninsular Malaysia. Through an act of Parliament, FRIM was established as a statutory body in 1985 and is now administered by the Malaysian Forestry Research and Development Board (MFRDB).

First established as a statutory body, FRIM was directly responsible to the Ministry of Primary Industries through the MFRDB a position that has enabled FRIM to present her views more directly with regard to matters related to forest policies. Since 2004, together with the Department of Forestry Peninsular Malaysia, FRIM is placed under the Ministry of Natural Resources and Environment (NRE). In other words, FRIM now plays a more proactive role in providing research input to the Ministry (Fig. 2).

From the perspective of R&D, FRIM is now able to expand her objectives to cover more areas of research. This can be considered the second advantage of being a statutory body. Among the new areas of research are environmental science, forest product utilization, forest economics, forest plantations, wood chemistry and medicinal plants. To further expand her capabilities, FRIM is also pushing towards collaboration in R&D with other institutions and industries. To date, more than 161 agreements (memoranda of understanding (MoU) and memoranda of agreement (MoA) have been signed, marking FRIM's commitment to working more closely with her clients.

Third, it is obvious that with the expansion in areas of research, the number of staff engaged in R&D work would also increase. In 1985, FRI had 67 research officers and the number increased to 234 in 2006. Between 1985 and 2006, the number of supporting staff also rose from 305 to 531. Such a big increase in the number of staff directly indicates the importance of research from the perspective of the Government of Malaysia (GoM).

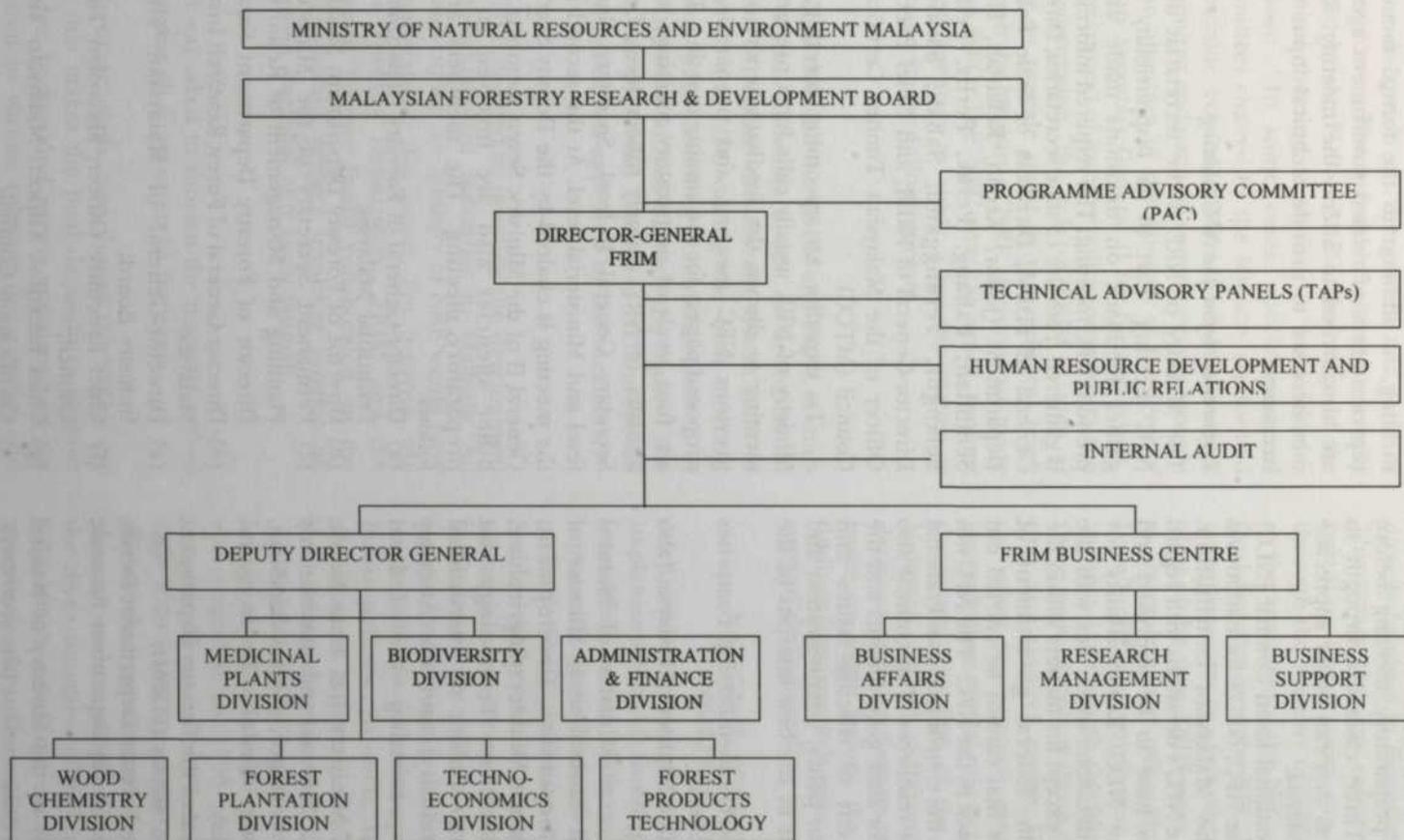


Fig. 2: FRIM Organization Chart 2003

NATIONAL FORESTRY COUNCIL

The following paragraphs highlight the formation of the National Forestry Council (NFC) and continue with a discussion on the NFC's membership and preparatory meeting before the NFC meets. Three cases are brought to readers' attention so they can better appreciate the situation in Malaysia.

In 1971, the National Land Council (NLC) decided to form the NFC. NFC's formation was not based on the Malaysian constitution. Therefore all of the NFC's decisions with regard to forestry matters have to be approved and confirmed by the NLC. Responsibility for implementing all decisions made lies with the state governments, except for matters within the jurisdiction of the federal government of Malaysia. Decisions that cannot be carried out must be referred back to the NFC. The NFC was formed to facilitate the coordination and rational utilization of forest resources. This council also provides a forum for state governments and the federal government to discuss issues and problems related to policy, administration and forest management in the best interests of the nation.

To date, the NFC's membership comprises the following members:

- (a) the Deputy Prime Minister of Malaysia (also the Chairman);
- (b) six ministers (i.e. Minister of Natural Resources and Environment; Minister of Land and Cooperative Development; Minister of Finance; Minister of Agriculture; Minister of Science, Technology and Innovation; and Minister of International Trade and Industry) and the Attorney General (representing the federal government);
- (c) all four Chief Ministers (i.e. from Sabah, Penang, Melaka, Sarawak) and nine Menteris Besar (Johor, Selangor, Negeri Sembilan, Perak, Pahang, Kedah, Terengganu, Kelantan, Perlis);
- (d) Director-General of the Forestry Department of Peninsular Malaysia (FDPM);
- (e) Director of the Forestry Department Sabah;
- (f) Director of the Forestry Department Sarawak; and
- (g) Chief Secretary of the Ministry of Natural Resources and Environment (the secretary).

The secretariat of the NFC is based in the Ministry of NRE; its secretary general is the secretary of the NFC. The NFC is programmed to meet at least once a year. During the NFC meeting, in addition to the formal members, representatives of related government agencies are also invited to attend the meeting. These members are to provide technical input when necessary.

Preparation before the NFC Meeting

The Ministry of NRE is the secretariat of the NFC meeting. Part of its responsibility is to gather feedback on decisions made at the previous NFC meeting. The required information is gathered from the 13 state secretaries, Director-General of FDPM, Directors of State Forestry Department (Johor, Kedah, Kelantan, Negeri Sembilan, Pahang, Perak, Perlis, Penang, Selangor, Terengganu, Sabah, Sarawak), Director-General of FRIM, and Chief Executive Officer of the Malaysian Timber Certification Council (MTCC).

To expedite an upcoming meeting, the Ministry of NRE usually calls for a preparatory meeting to discuss the feedback report of the previous NFC meeting and preparation of proposed papers for the coming meeting. There are four levels of preparatory meetings at the Ministry of NRE, namely officer level, Deputy Secretary General II level, Secretary General level and Ministerial level. At the second level, the meeting is chaired by the Deputy Secretary General II of the Ministry. Seven members from other agencies also are involved in this preparatory meeting. The members are as follows:

- (a) Director-General of Forestry Department of Peninsular Malaysia;
- (b) Director of Forestry Department Sabah;
- (c) Permanent Secretary of the Ministry of Planning and Management of Resources / Director of Forestry Department Sarawak;
- (d) Director-General of Forest Research Institute Malaysia;
- (e) Director-General of Malaysian Timber Industry Board;
- (f) Chief Executive Officer, Malaysian Timber Council;
- (g) Chief Executive Officer, Malaysian Timber Certification Council.

Before the preparatory meeting at the Deputy Secretary General II level, the relevant agencies work together through various technical committees. For example, FRIM and FDPM may hold a discussion on the growth and yield of natural forests. The technical meeting is normally chaired by the FDPM. At the final stage of the technical meeting, a seminar is held for this purpose. In some cases, special national committees chaired by the Ministry are formed to examine related matters. The outcomes of the seminar and national committees are brought to the attention of the Ministry at the level of Deputy Secretary General II for further action. In the context of forestry policy formulation and implementation, the role of FRIM is seen as being to provide input at the technical level; through the Ministry of NRE, decisions are made at the NFC. The NFC may, at times, request related agencies to study a specific matter as indicated in the following cases.

Case 1

The NFC directed the FDPM and FRIM to study the "annual allowable coupe to be based on volume to replace the current system" and to report to the NFC during the next meeting. Subsequently, a working committee chaired by the FDPM was formed to study the matter. The result was presented later in a NFC proposed paper, which was approved by the members.

Case 2

The NFC decided to promote the development of medicinal-plant industries in Malaysia. All agencies under the Ministry of NRE would have to cooperate in this aspect. For instance, the Johor Forestry Department, FRIM and the Malaysian Rubber Board collaborated on the medicinal-plant project involving tongkat ali (*Eurycoma longifolia*) and kaci fatimah.

Case 3

FRIM was asked to shorten the maturity period of tongkat ali from seven to five years.

In other words, even though the NFC is the body that makes the final decision, to support the idea, background papers and proposals are prepared by various relevant departments and agencies. Once a decision is made, the various

state governments are required to cooperate in implementing the decisions.

From the preceding paragraphs, it is clear that a research institution such as FRIM is not directly involved in formulating forest policies. This means that any comments or suggestions regarding forest policy can be extended only through the Ministry of NRE and later brought to the attention of the NFC. Depending on the final directive from the NFC, FRIM can be either an implementer or a formulator of forest policies. Most of the time FRIM plays a more direct role as an implementer rather than as a formulator. Usually, FRIM's contribution as a formulator is indirect, i.e. through the Ministry of NRE. The three cases described above clearly demonstrate that, as a research centre, FRIM together with the other two research centres in Sabah and Sarawak has a crucial role to play in determining the future direction of the forestry sector in Malaysia. Stated differently, even though decisions made on forestry and other fields are based on many factors, the fact remains that findings from research serve as hard evidence to support decision-making in any field of interest.

NATIONAL FOREST POLICY AND LEGISLATION

A discussion on the formulation and implementation of forest policies would be incomplete without referring to other related topics such as the National Forestry Act (NFA) of 1993. The main reason behind this is that, besides the restricted organizational structure (there is no representative from the research institute in the NFC), the NFP as well as legislation determines the research institution's participation in formulating and implementing forest policies. As such, understanding the development of these policies and legislation is a fundamental issue.

Before the NFA is discussed further, it is helpful to examine briefly the NFP 1978, which was amended in 1993. A major difference between the amended forest policy of 1993 and NFP 1978 is the emphasis on management of the so-called permanent forest estates (PFE) for research and education. This is well and above the three functions of PFE that were listed in 1978, which included protective, productive and amenity forestry. The inclusion of research and education in the amended version of the NFP

indirectly indicates the important role given to other multiple uses of forests, besides timber, in the context of sustainable management of forest resources. The areas of research have also been expanded as a result of its inclusion in the amended version of the NFP.

Implementation of the various provisions contained in the NFP is within the jurisdiction of the state governments. At this juncture, the federal government (FG) plays only an advisory role. For example, the FG may prescribe a certain target area for logging each year, but the decision as to the size of area to be logged still is made by the state government. Nonetheless, the difference in sizes of areas to be logged, especially those under the PFE, is usually not that substantial. A major area open for logging usually comes from state lands, which are converted into various development projects.

NFA 1993, an amendment of NFA 1984, allows for a more efficient enforcement of the principles of forest management through higher fines for unlawful logging activities. Na'aman (2002) quoted a minimum fine of RM10,000 (approximately USD2,632) or imprisonment for a period not exceeding three years and a maximum fine of RM500,000 (approximately USD131,579) or imprisonment for a period not less than one year but not exceeding 20 years for activities such as illegal logging and timber theft. If one were to trace the development of forest management in Malaysia, one would discover that enactments and ordinances were formulated and enforced by state authorities as early as 1910. It was through NFA 1984 that the legislation with regard to forest planning and operations was standardized and strengthened. Together with NFA 1984, another important development in the Malaysian forestry sector is the so-called Wood-based Industries Act (WIA), also endorsed in 1984. The NFP and the other two acts (NFA and WIA) further ensure the sustainable management of natural forest resources.

The concept of sustainable forest management is not a new issue in the field of forestry at either the local or international level. Because the forest is viewed not only for its timber value but also for its non-timber values, such as environmental protection, biodiversity conservation, socio-economic contribution and watershed protection to name just a few, the importance of research to fulfill these functions

is more critical than ever. Findings derived from research would then serve as important inputs in decision-making processes.

Other legislation that is of direct relevance to the development of the forestry sector in Malaysia includes:

- National Land Code 1965
- Penal Code (FMS Cap. 45), 1948 (Amended 1993)
- Criminal Procedure Code (FMS Cap.6), 1903 (Amended 1995)
- Evidence Act, 1950 (Amended 1993)
- Financial Procedure Act 1967
- Water Enactment 1935
- Land Conservation Act 1960
- Protection of Wildlife Act 1972
- Malaysian Timber Industry Board Act 1973
- National Park Act 1980 (Amended 1983)
- Malaysian Forestry Research and Development Board Act 1985
- Mining Enactment 1926
- Local Government Act 1976

Another policy related to the development of the forestry sector is the National Policy on Biodiversity (NPB), which was endorsed in 1998. Based on its 11 main principles, the NPB is aimed at transforming Malaysia into a world centre of excellence in conservation, research and sustainable utilization of tropical biological diversity by 2020. Clearly, excellence in tropical research is one of the focal points of the NPB. To achieve this challenging goal, all categories of communities have to be involved directly or indirectly with formulating and implementing the NPB.

CHALLENGES IN IMPLEMENTING FOREST POLICIES AND LEGISLATION

The endorsement of all policies and legislation was meant to sustain the existing role of the forest as a provider of both goods and services for society. Nonetheless, it is not an exaggeration to say at this juncture that some, if not all, of the countries in this world are facing challenges in implementing their forest policies and legislation in one way or another. The difference between these countries perhaps lies in the extent of the so-called challenges. In fact, implementing such forest policies and legislation becomes more challenging when it involves the social issues, especially indigenous people. Malaysia is no exception to this situation.

For instance, in implementing the NFP, Malaysia faces several challenges. First is with regard to the effectiveness of implementing the policy at the state government level (in contrast to the federal government). As mentioned earlier in this section, implementing provisions contained in the NFP is within the jurisdiction of the state. A similar challenge may also arise at the district level. Besides the question of effectiveness, the way research findings are presented to policy-makers also plays a major role in the formulation of forest policies.

Abdul Razak *et al.* (2002) pointed out overlapping roles of ministries with regard to issues such as flora and fauna, which may also hinder the effectiveness with which said policies are implemented. According to Abdul Razak *et al.* (2002), the Ministry of Primary Industries was responsible for implementing the NFP through the Department of Forestry, whereas the Ministry of Science, Technology and Environment was responsible for implementing the Protection of Wildlife Act through the Department of Wildlife and National Parks (DWNP). The NFP itself is aimed at sustainable management of natural forest resources, which include both flora and fauna found on site. The creation of another policy, which is supposed to be handled by another department, would obviously hinder the effectiveness of the implementation of such a

policy, as too many departments are involved. However, with the establishment of the Ministry of NRE in 2004, the Forestry Department of Peninsular Malaysia and Department of Wildlife and Natural Parks are now placed in the same ministry. The issue of overlapping roles does not exist for Sabah and Sarawak because the two states are responsible for managing their own flora and fauna. A similar issue regarding the ineffectiveness of the concept of sustainable forest management was also raised by Abdul Razak *et al.* (2002) with regard to the Environmental Impact Assessment (EIA) of forest areas opened for logging. Exemption of areas less than 500 hectares from the EIA is considered inappropriate because an area of less than this size is also expected to have a major impact on the fauna and flora once it is subjected to logging activity (Lim and Shamsudin, 2006).

Another challenge worth mentioning is the issue of the two separate regions, West and East Malaysia (Abdul Razak *et al.*, 2002). West Malaysia includes all 11 states and 1 Federal Territory, whereas East Malaysia comprises Sabah and Sarawak. Table 1 indicates the legislation pertaining to both forestry and biological diversity in the two regions. Clearly, both Peninsular Malaysia and Sabah and Sarawak have their own legislation, insofar as efforts to manage their own flora and fauna are concerned.

TABLE 1
Legislation relevant to forestry and biological diversity in the two regions

Region	Legislation
West Malaysia 11 States and 1 Federal Territory in Peninsular Malaysia	Taman Negara* (Kelantan) Enactment 1938
	Taman Negara* (Pahang) Enactment 1939
	Taman Negara* (Terengganu) Enactment 1938
	Aboriginal Peoples Act 1954
	Land Conservation Act 1960
	National Land Code 1965
	Protection of Wildlife Act 1972
	National Parks Act 1980
	National Forestry Act 1984
	Parks Enactment 1984
East Malaysia, Sabah	Forest Enactment 1968
	Fauna Conservation Ordinance 1963
East Malaysia, Sarawak	National Ordinance 1956
	Wildlife Protection Ordinance 1958
	Forests Ordinance 1954
	Natural Resources Ordinance 1949 as amended by Natural Resources and Environmental (Amendment) Ordinance 1993
	Public Parks and Green Ordinance 1993
	Water Ordinance 1994

Source: Abdul Razak *et al.* (2002).

*Taman Negara denotes National Park. The State Parks of Kelantan, Pahang and Terengganu form Taman Negara.

Earlier in the text, it was mentioned that there are three separate bodies dealing with research in forestry in Malaysia, namely FRIM, the Forest Research Centre (Sabah) and the Forest Research Institute (Sarawak). Sabah's Forest Research Centre and Sarawak's Forest Research Institute are under the Department of Forestry of the each particular state. Obviously, the focus of research that is carried out also varies, depending on the demand in each state. In short, what may be a priority for FRIM may not be so for Sabah's Forest Research Centre and Sarawak's Forest Research Institute. Usually, research carried out by FRIM is aimed at achieving national benefits, whereas research by the Sabah and Sarawak Research Centres is aimed primarily at solving local problems. Today, FRIM is stepping up efforts to bridge the areas of research for the three separate entities.

CONCLUSION AND RECOMMENDATIONS

From the various discussions highlighted in several sections of this paper, R & D institutions such as FRIM will have a much larger role to play as more emphasis is placed on research as a means of achieving sustainable management of natural forest resources. The demand to carry out the multiple roles of providing goods and services to society calls for more coordinated efforts between not only research institutions (i.e. at the federal and state levels) but also stakeholders that have either direct or indirect interest in the forest.

The current organizational structure has enabled FRIM to participate actively in the formulation and implementation of forest policies in one way or another, as compared with the old structure. Nonetheless, such a proactive role can be further improved if FRIM is a member of the NFC. FRIM, formerly known as FRI, was not a member of the NFC when it was formed in 1971. With the current set-up, i.e. being directly responsible to the Ministry of NRE, it is highly timely that some consideration be given to include FRIM in the NFC. Such an opportunity will allow all matters pertaining to forestry to reach FRIM directly, without going through a second or even a third party. To accommodate a research institution such as FRIM, the NFC may need to create another layer, called the Technical Committee. The Technical Committee could act as the right arm

of the NFC by providing R&D findings as and when required.

Besides the organizational structure, other areas that need immediate attention include repackaging of R&D findings, a more proactive role of research officers in presenting their views to policy-makers, and inclusion of all stakeholders in decision-making processes. Many publications of R&D findings are too technical and difficult for the ordinary layperson to grasp. As such, efforts to repackage these R&D findings should, among other things, use less technical jargon and give down-to-earth examples. Road shows would be a good channel through which R&D information is disseminated to interested clients. This means that the role of a research officer does not stop once she or he has completed the study. A much bigger task is to disseminate the research findings, especially to policy-makers. With the current demand for more input from the research community, the research officer has no choice but to play a proactive role in disseminating R&D findings. This can easily be done through networking.

In all, to ensure the effectiveness of the formulation and implementation of forest policies, all stakeholders must be involved in decision-making processes. This can easily be done through public participation. Nevertheless, active public participation does not guarantee that there will be no more problems, but rather it may help reduce unnecessary conflicts or even lead to more accommodating solutions (Canadian Institute of Forestry, 2003).

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Keywords: Ecological mapping, forest plantation, stakeholder analysis

ABSTRACT

Forest plantation activity is one of the components in forestry industry which is being described as a high yielding supply of timber and fibre resources. Currently, the production of forest plantation is 230,000 ha and is the future target area is double this area to 460,000 ha. In order to achieve this target, strategies need to be developed. This has to start with a stakeholder analysis and evaluation. The objectives of the study is to identify stakeholders, to identify the need in forest plantation management by following an evaluation of opportunities and obstacles present in the forest plantation management, and to formulate recommended actions for forest plantation management in Malaysia. The study adopted a stakeholder analysis using the stakeholder group mapping approach where a network of interests and issues are listed to help identify opportunities. The results and findings were aggregated, listed and presented in form of key messages. From the findings, strategies, recommended actions and proposal. The recommendations drawn are to use a high level of forest activities of forest plantation management in Malaysia.

INTRODUCTION

The forestry sector is expected to be Malaysia economic and sustainable player in the next 20 years in the country's socio-economic development. In 2006, about 11,620 million of timber and wood based products are expected to be produced. In order to sustain and increase the capacity of the manufacturing, a steady supply of timber is needed. One of the strategies in increasing supply of timber is by planting fast-growing timber species.

In 1992, the Malaysian Government launched the Sustainable Forest Plantation Project (SFP) with the target to establish approximately 100,000 ha of forest plantation during 10 years (Lim et al., 2006). Currently the total area of plantation forest is 2,400,000 ha and in the future, Malaysia aims to double this area to 4,800,000 ha. In order to achieve this target, major efforts need to be done to encourage government, private companies and the public sector to participate in the forest plantation and also, SFP) was the first to start a stakeholder analysis was undertaken. The objectives of the study were to identify stakeholders in forest plantation management in Malaysia, to evaluate the opportunities and obstacles present in the forest plantation management, and to formulate recommended actions for forest plantation management in Malaysia.

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The IISN contribution number was supported using the stakeholder mapping approach where a network of interests and issues are listed to help identify opportunities. The strategies and findings were aggregated, listed and presented in form of key messages. From the findings, strategies, recommended actions and proposal. The recommendations drawn are to use a high level of forest activities of forest plantation management in Malaysia.