



Malaysia

*Rakyat Didahulukan,
Pencapaian Diutamakan*

PROCEEDINGS OF THE 16th MALAYSIAN FORESTRY CONFERENCE

Forests for Community Livelihood
Hutan Untuk Kesejahteraan Masyarakat

**5-9 DECEMBER 2011
RENAISSANCE HOTEL
MELAKA BANDARAYA BERSEJARAH**



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Participants of the 16th Malaysian Forestry Conference

FOREWORD

In the name of Allah, the most Gracious and most Merciful.

At the outset, let me take this opportunity to express my utmost gratitude and sincere thanks to all participants, especially officers from the Forestry Departments of Sabah, Sarawak and Peninsular Malaysia for their continuous support and active participation for making the 16th Malaysian Forestry Conference a great success.

The 16th Malaysian Forestry Conference has been successfully organised from 5-9 December 2011 in the historical city of Malacca, Malaysia. This Conference has successfully achieved its main objective - to provide a platform for closer contact and fruitful deliberations amongst its participants on current issues related to forestry, especially - focussing on its current theme "Forests for Community Livelihood". In this regard, I am pleased to present and share all outputs generated from this 16th Malaysian Forestry Conference in this Proceeding.

The 16th Malaysian Forestry Conference has concluded with a total of 6 important resolutions and 26 follow-up actions. The various pertinent follow-up actions outlined to materialise these resolutions are:

- Recognising that forest management certification is a meaningful yardstick for effective implementation of sustainable forest management, the Conference resolved that all Forest Management Units (FMUs) be encouraged to fully undertake forest management certification under Malaysian Timber Certification Scheme (MTCS) or other credible internationally recognised scheme; frequent consultation amongst the forestry agencies of Malaysia; availability of adequate funds and technical support; wider participation and consultation with relevant forestry stakeholders; improving community forestry; and continuous updating on the importance and state of implementation of forest management certification.
- Recognising the increasing demand on forest for recreation and ecotourism activities, the Conference resolved that intensifying of consolidated efforts to enhance capacity building, promotions and marketing; further development of potential economic opportunities; encouraging greater participation of local community; and exploring new potential ecotourism areas.

- Recognising the important roles of forest in mitigating the adverse effects of climate change, the Conference resolved that exploring of new concepts, policies, initiatives and research activities related to climate change; formulation and implementation of mitigation and adaptation measures; and availability of adequate funding and technical support for mitigation.
- Recognising the significance of forest biodiversity and conservation, the Conference resolved that further enhancement of protection of high conservation value areas; intensifying efforts to harness forest biological resources; formulation of Access and Benefit Sharing (ABS) of biological resource mechanism; further emphasising ex-situ conservation of rare, endangered and threatened species; and further enhancement of Conservation Education and Public Awareness (CEPA) initiatives.
- Recognising that R&D and innovations are crucial towards realising sustainable forest management, the Conference resolved that further exploration of state-of-the-art technologies and innovative approaches; further optimisation of utilisation of the rich biological diversity for the development of herbal, ornamental, cosmetic and pharmaceutical products; intensification of professionalism and expertise through capacity building; and synergisation of cooperation and collaboration among researchers, forest managers and stakeholders.
- Recognising the importance of fostering greater integrity, professionalism and dedication of forestry personnel, as well as in enhancing law enforcement towards sustainable forest management, the Conference resolved that existing forestry legislations be kept up-to-date and relevant; capacity building for forestry personnel involved in legal and prosecution matters; enhancement of exchange of information on law enforcement; and employing of innovative technologies and integrated approaches.

It is my humble hope that this Proceeding has successfully recorded all these outcomes of the deliberations of the 16th Malaysia Forestry Conference. It will serve as an important and useful reference document for the future Malaysian Forestry Conferences' undertakings in supporting our commitments to ensure that forestry sector remains relevant and contributing significantly to the socio-economic development of Malaysia.

Thank you



DATO' PROF. DR. HJ. ABD. RAHMAN BIN HJ. ABD. RAHIM
Director-General of Forestry
Peninsular Malaysia

November 2012

PREFACE

The Malaysian Forestry Conference (MFC) is held in rotation every three years amongst the Forestry Departments of Sabah, Sarawak and Peninsular Malaysia. This Conference provides a forum for Malaysian Foresters to exchange and share information, views and experiences in the administration, management and developments of the nation's forest resources. The Forestry Department Peninsular Malaysia hosted the 16th Forestry Conference with the theme "Forests for Community Livelihood" from the 5 - 9 December 2011 in the historical city of Malacca. The five (5) days Conference were attended by 232 participants from the Forestry Departments of Sabah, Sarawak and Peninsular Malaysia as well as the Sarawak Forestry Corporation and 49 observers from the various local forestry related agencies.

The five (5) main objectives of MFC are (i) to provide a platform for discussing and resolving problems collectively, pertaining to the aspects of forest development; (ii) to co-ordinate the planned management of the forest resources and its utilisation, seeking means and methods leading to the development and diversification of the forest industries with the aim of maximizing its contribution to the socio-economic development of the nation; (iii) to co-ordinate lines of research and the use of improved techniques in all aspects of forestry operations and utilisation; (iv) establishing a closer working relationship and understanding among foresters from all over Malaysia and (v) generating public consciousness on the importance of forestry as an integral element in nation building.

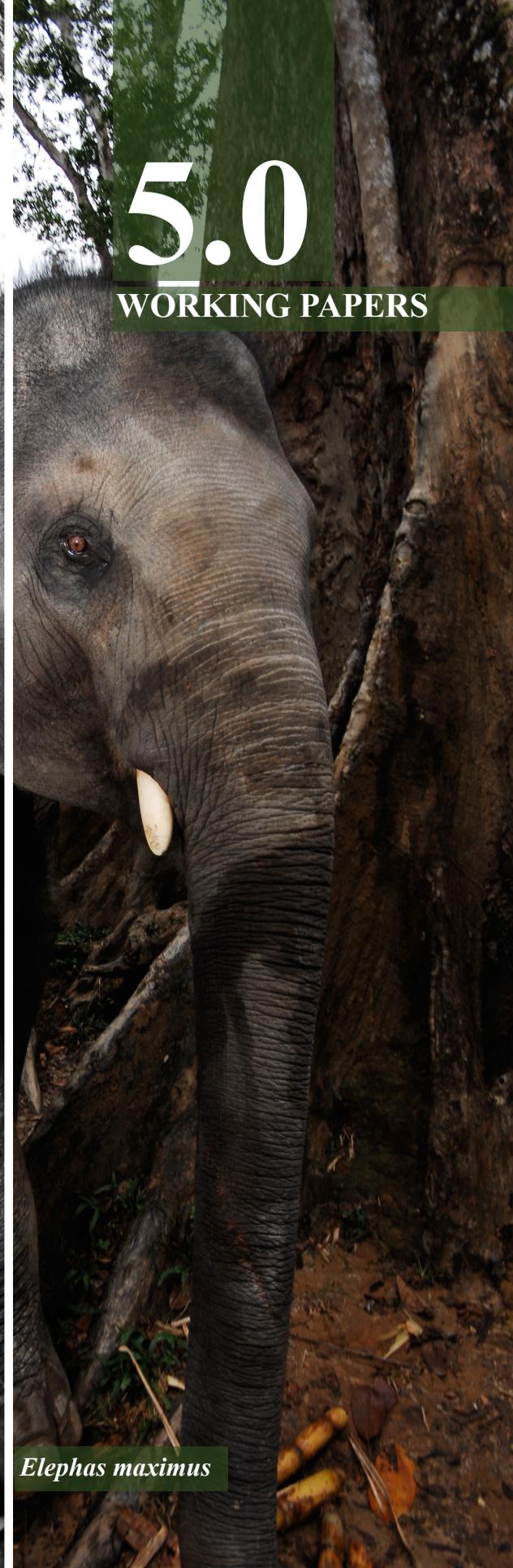
The 16th MFC has received 61 papers and 18 posters. Of these 61 papers, 36 were working papers and 25 being information papers. These working papers were presented and discussed in six (6) plenary sessions. Five (5) papers were presented in plenary session 1: Sustainable Forest Management and Forest Certification; six (6) papers in plenary session 2 : Forest Economics and Ecotourism; six (6) papers in plenary session 3 : Forest and Climate Change; seven (7) papers in plenary session 4 : Forest Biodiversity and Conservation; eight (8) papers in plenary session 5 : Innovations and R&D in Forestry and four (4) papers in plenary session 6 : Forest Laws and Enforcement. At the end of the Conference, a total of 6 resolutions with 26 follow-up actions were adopted based on these six (6) plenary sessions.

We would like to take this opportunity to acknowledge and record our appreciation and thanks to Dato' Prof. Dr. Hj. Abd. Rahman bin Hj. Abd. Rahim, Head of delegation for Forestry Department Peninsular Malaysia; Datuk Sam Mannan, Head of delegation for Forestry Department Sabah; Tuan Hj. Ali Yusop, Head of delegation for Forest Department Sarawak, members of the Organising Committee and Sub-Committees as well as the Resolution Committee, the sessions chairman, the rapporteurs, the authors, the presenters, the editors and all those who have contributed and supported in preparing this finalised Proceeding.

Thank you



Muhamad Azmi bin Ibrahim
Chief Editor



5.0

WORKING PAPERS

Elephas maximus

5.1 Plenary Session 1

SUSTAINABLE FOREST MANAGEMENT AND FOREST CERTIFICATION

*(Pengurusan Hutan Secara Berkekalan
Dan Pensijilan Hutan)*

PLANNING A STATE WIDE FOREST INVENTORY OF SARAWAK WITH EMPHASIS ON APPROPRIATE SAMPLING DESIGN

AHMAD ASHRIN M. B¹, AFFENDI S¹, ARIFIN A.Z¹ AND WAN RAZALI W.M.²

ABSTRACT

Statistics derive from a forest inventory are key information when managing valuable forest resources. Hence, accurate and latest information on forest resources is crucial and critical to obtain in order to prepare the Sustainable Forest Management plans over the forest area in Sarawak. In Sarawak, three types of forest inventory were carried out in the last 40 years, i.e. Forest Resource Inventory (FRI), Forest Management Inventory (FMI) and Forest Operational Inventory (FOI). In view that the existing inventories had been used for last 40 years, Forest Department Sarawak is planning to review and develop an accurate and appropriate new sampling design for the current and future inventories of its forest resources. This study in collaboration with Universiti Putra Malaysia is to support the development of efficient sampling design for forest inventories in Sarawak.

INTRODUCTION

Sarawak is the largest of Malaysia's 13 States and one of the two States located on the third largest island in the world – Borneo. Known as the land of the Hornbills, Sarawak has 12.38 million hectares of land area or 37.6 per cent of Malaysia's 32.83 million hectares landmass. About 8.61 million hectares or 70 per cent of its land is still covered with forests. Of these, 6 million hectares has been designated as Permanent Forest Reserve (PFR) for Sustainable Forest Management (SFM) practices, 1 million hectares for Totally Protected Area (TPA) and the remaining areas fall under the category of stateland forest.

Although five types of natural forest are recognised in Sarawak, only three main types predominate and are considered as major forest types. These are Hill Mixed Dipterocarp Forest with an area of about 7.2 million hectares or 84 per cent; Peat Swamp Forest accounting for about 1.03 million hectares or 12 per cent; and Mangrove Forest taking up 86,100 hectares or 1 per cent of land area under forest cover. The other two types, the Kerangas and Montane Forests are minimal in size.

Administratively, the forests are managed by four Regional Forest Divisions – Kuching, Sibul, Bintulu and Miri, spread over the nine Civil Administrative Divisions, namely Kuching, Samarahan, Sri Aman, Sarikei, Sibul, Kapit, Bintulu, Miri and Limbang.

Since independent, the forestry sector has played a major role in contributing to the state government's earning with an average of RM700 million per annum or one third of the state revenue. It provides job opportunities for a significant segment of the population in Sarawak.

1 Forest Department Sarawak

2 Universiti Putra Malaysia, Serdang, Selangor

YIELD REGULATION IN NATURAL FOREST MANAGEMENT: A CASE STUDY OF THE DERAMAKOT FOREST RESERVE

ROBERT C. ONG¹ AND JULSUN J. SIKUI¹

ABSTRACT

While yield regulation methods for even-aged plantations managed under a clear-felling regime are relatively straightforward and well-established, methods for natural mix tropical forests present many complexities. One very important aspect of yield regulation is the determination of the annual allowable cut (AAC) or prescribed annual yield. The sustainable timber yield is usually analysed through some form of growth projections or modelling of inventory data. The next important consideration in yield regulation is the spatial allocation of yield. In tropical forestry, there is a preoccupation with the use of MAI as a means to measure yield sustainability either at a stand level or forest level. Whilst volume MAI is commonly used in monitoring the growth of tree plantations, its usefulness in natural forest management for timber is less important, particularly because harvesting is highly selective due to the imposition of species and diameter constraints. Such a simplistic notion of translating mean annual volume increments to yield can lead to erroneous results. This paper provides a case study of how actual field inventory data for Deramakot is used in determining the AAC. The paper also discusses the use of continuous forest inventories in yield regulation.

INTRODUCTION

The Deramakot Forest Reserve

The Deramakot Forest Reserve covers an area of approximately 55,083 *ha* of logged lowland dipterocarp forest in central Sabah (Figure.1). Generally, the landscape of Deramakot is made up of gently undulating terrain and low hills. The highest point in the reserve is 335 *m* a.s.l. while about 70 % of the reserve falls below 100 *m* a.s.l.

As defined in the Forest Management Plan for Deramakot (planning period 2005-2014), the area is designated primarily for sustainable timber production from the natural forest. About 89.6 % (or 49,374 *ha*) of Deramakot is zoned for timber production, while about 7 % (3,605 *ha*) of the area is zoned for protection. The production zone refers to areas designated for timber production, and where forest regeneration is by natural regeneration (assisted or otherwise) or enrichment planting. The protection zone refers to areas excluded from harvesting due largely to steepness of terrain. For operational planning purposes, Deramakot is divided into 134 compartments ranging in size from 110 *ha* to 900 *ha* (Figure 2). Compartment boundaries are delineated according to natural features such as ridges and rivers, as well as roads. Since virtually all of Deramakot has been logged, it has an extensive network of logging roads. In 1997, Deramakot was assessed and certified as fulfilling the requirements of a 'well-managed' forest in accordance with the standards set by the Forest Stewardship Council.

¹ Sabah Forestry Department

COMMUNITY FORESTRY PROJECTS UNDER THE 9TH MALAYSIAN PLAN PROGRAM : DOWN TO EARTH PROJECTS?

JEFUS S SINAJIN¹ AND RICKY A MARTIN²

ABSTRACT

Most of the local communities are no longer living in conditions of balanced ecosystems that long ago they managed to maintain. The depletion of forest resources and the “modernization” of thinking of these communities with new fashions and consumerism trends have led to changes in their way of living. In its turn, such alterations give rise to new needs and values which may imply further forest degradation or forest loss. As a step to overcome these problems, the Sabah Forestry Department in collaboration with the local communities implemented the community forestry projects in Mangkuwagu Forest Reserve (MFR), Bengkoka Forest Reserve (BFR) and Kg. Gana respectively under the 9th Malaysian Plan programmes. Therefore, this paper attempts to assess the roles and success to-date of these three community forestry (CF) projects.

Based on the assessment, the paper stresses that local communities or project participants have a mutual relationship with forests and could be partners in forest management efforts if the needs, desires, aspirations and perceptions of the various project participants are considered and they are accommodated in the planning, decision-making process and implementation that subsequently enhanced their living standards. Thus, the approach and the methodology of the projects have been highlighted in this paper. The paper also highlights the results of the CF projects, which so far received positive feedback from the project participants of which some of their comments are included in this paper. Besides that, the CF projects also open the paths for the introduction of the various facilities in the three project areas such as roads, clean water supply, electricity and educational facilities. This paper concludes that no strategy to conserve or manage the forests on a sustained basis would be successful unless the needs of the project participants are considered and their perpetuity guaranteed. Thus, the projects need to be continued for another 5 years.

INTRODUCTION

Local communities especially those living within and adjacent to the forests have a symbiotic relationship with forests and could be partners in the forest development efforts. A balanced approach to protection, conservation and management of forests with the sole aim of development of the local communities living within and adjacent to the forests can help to alleviate poverty, promote sustainable development and environmental protection. Participation is the cornerstone of community forestry because communal forestry was developed in part as a response to the recognition for effective sustainable forest management to occur.

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IMPLEMENTING FOREST CERTIFICATION AND ENVIROMENT MANAGEMENT SYSTEM (EMS) ISO 14001 IN SUSTAINABLE FOREST MANAGEMENT: SABAH EXPERIENCE - KTS PLANTATION SDN. BHD

JEFUS S. SINAJIN,¹ MASHOR MOHD. JAINI², MUSA SALLEH², DAVID CHIENG³
AND KELVINS KONG⁴

ABSTRACT

Concerns pertaining to the impact of economic activities on the environment have led to the development of forest and environmental certifications. Two types of certification standards that are applicable to forestry are the performance standard such as the Malaysian Timber Certification Scheme (MTCS) and the process standard of ISO 14001 Environmental Management System (EMS). These certification schemes which relate to forest management practices are compared based on KTS Plantation Sdn. Bhd's experiences in Sabah. The driving factors, implementation process and benefit-effects of these two systems are evaluated by considering the real life situation of this company that is actively involved in Sustainable Forest Management implementation. Overall, the two approaches are not mutually exclusive. However, if the use and limitations of each are understood, they are not competing systems, but rather complementary in implementing and assessing Sustainable Forest Management. MTCS does not require an ISO 14001, but does require that the company has an EMS system. ISO 14001 could be a powerful mechanism to help organisation to achieve and maintain MTCS certification.

INTRODUCTION

Global concerns about deterioration of the environment and numerous associated forestry issues have led to the adoption of the "Forest Principles" for the management, conservation and sustainable development of all types of forests at the Rio Earth Summit or United Nations Conference on Environment and Development (UNCED) in 1992. Since the 1992 Earth Summit, international interest in sustainable development of natural resources has seen some concrete results. Most significantly among these perhaps is the development and implementation of Sustainable Forest Management (SFM), which is commonly viewed as one of the most important contributions of the forestry sector to overall socio-economic development. In our case, the concept of SFM has been widely accepted, developed and implemented at the national, state and FMU (Forest Management Unit) level.

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2 Senior Forest Management Officer, Sustainable Forest Management Division, Sabah Forestry Department.

3 Senior Manager, KTS Plantation Sdn. Bhd.

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PRELIMINARY ANALYSIS OF RIVER WATER QUALITY MONITORING IN PERMENENT RESERVED FOREST IN PAHANG

SALIM AMAN¹, F.S. LAI,² ABD. RAMLIZAUYAHHUDIN MAHLI¹ AND MARLINA OMAR¹

ABSTRACT

Forests play a vital role in regulating water flow which is the main source of water supply in the country. At the same time, the water quality draining forested watersheds is generally of high quality because the vegetation and litter on forest floors protect the ground surface from the erosive impact of rainfall. That water quality is one of the concerns listed under the Schedule of Conditions for Certification in the state Forest Management Units (FMU) suggests the importance to the concern on environmental quality. This paper presents the findings of the pilot study conducted in Pahang with the objective of developing a suitable approach for environmental monitoring for water quality within the Permanent Reserved Forest.

INTRODUCTION

The water quality draining forested watersheds is generally of high quality because the vegetation and litter on forest floors protect the ground surface from the erosive impact of rainfall. Removal of all or part of the forest cover reduces water retention capability of watersheds, resulting in increased peak water runoff. At the same time, erosion of ground surface and subsequent sediment transport in affected stream systems reduces stream water quality, the severity depending on the extent of forest cover removal and bare land exposure.

Watersheds with natural forest cover are frequently the source of good water for both domestic and industrial (including agricultural) water. Uncontrolled reduction of vegetation in such watersheds can lead to declining water quality, usually resulting in public and related agency complaints on water related matters.

Foresters are concerned over the influence of forest practices on water quality. The need to have more foresters knowledgeable about water quality and its relation to the efficiency of best management practices is therefore essential. That water quality is one of the concerns listed under the Schedule of Conditions for Certification in the state Forest Management Units (FMU) suggests the importance attached to environmental quality.

Study Background and Objectives

Under the requirements identified in the Schedule of Conditions for Certification in the state FMU under the purview of the Malaysian Timber Certification Council (MTCC), the Malaysian Criteria, Indicators, Activities and Standards of Performance for Forest Management Certification (MC&I) are:

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5.2 Plenary Session 2

FOREST ECONOMICS AND ECOTOURISM

(Ekopelancongan Dan Ekonomi Hutan)

NIAH NATIONAL PARK: BEYOND CAVES AND ARCHAEOLOGY, PUTTING NIAH BACK ON THE WORLD'S TOURISM MAP

RAMBLI AHMAD¹, OSWALD BRAKEN TISEN¹
AND ABANG ARABI ABANG AIMRAN¹

ABSTRACT

In 1958, the world was astounded by the finding of “Deep Skull”, the earliest evidence of modern human remains anywhere in the world (Solheim, 1983). The archaeological findings at Niah became a major attraction and placed Niah as a must visit place in the region. Of late, however, the popularity of Niah as a preferred tourist destination seems to fade, sliding off the tourism radar to other destinations such as Mulu and Kinabalu Park as a preferred tourism chart. Tourism products in Niah are not only limited to archeology, caves or forests but it could also include the surrounding environment and communities. The Niah River that runs adjacent to the park is teeming with salt water crocodiles. The river meets the sea 20 kilometers away at Kuala Niah where you find beautiful sandy beaches and coastal vegetation inhabited by exciting wildlife such as proboscis monkeys and fireflies, while at Kampung Kuala Niah the showcase include local fishermen culture. These attributes can be developed into a variety of prime tourism products such as wildlife watching, fishing, boating and handicrafts, to benefit the local communities and compliment Niah National Park.

INTRODUCTION

Niah National Park is situated approximately halfway between Miri and Bintulu in Sarawak, Malaysian Borneo; at a distance of 109km from Miri and 118 km from Bintulu, approximately 1½ hours from either place. The park which includes the limestone hills of Gunung Subis and its surrounding forests bordered by Niah River in the east, Sekaloh River in the south and Tangap River in the west was gazetted as the third Sarawak’s National Park under the Sarawak’s National Park Ordinance in 1974, covering an area of 31.4 km² or 3,138 ha (Sarawak Government, 1975). In the gazette notification, the designation serves two primary purposes, the protection of the karsts features and surrounding forests and the protection of globally significant prehistoric remnants. Earlier, the West Mouth and the Painted Cave of the Niah Caves were declared as a National Historic Monument under the Sarawak Cultural Heritage Ordinance in 1972.

Niah caves were visited in the early year by western explorers. Among the first to visit was A.H.Everett in 1880 who explored the caves in the Kuching area in the effort to find the “missing link” following a suggestion by Alfred R. Wallace in 1864. From the exploration by A.H.Everett noted that there was nothing of interest about Niah caves. The reason for this comment could have been that Niah at that particular time was still under the territory of Brunei (Solheim, 1983, Cranbrook, 1983). After seventy four years later, from 1954 to 1967, an archeological project lead Tom and Barbara Harrison and assisted by Lord Medway, (presently the Dato Sri Earl of Cranbrook) successful discovered archeological findings that include Paleolithic and Neolithic tools; wall paintings; ancient burial artifacts which include pottery, burial jar and burial boats. Also, the famous 42,000

¹ Sarawak Forestry Corporation

ECOTOURISM DEVELOPMENT IN NATIONAL PARKS OF SARAWAK: EXAMINING THE ROLES AND CONTRIBUTIONS OF TOUR OPERATORS AND LOCAL COMMUNITIES

SUHAILI MOKHTAR¹ AND SHIRLEY LYN MICHAEL GIAS¹

ABSTRACT

National parks of Sarawak are the backbone of tourism in Sarawak and have been identified as such under the national Economic Transformation Programme. Much has been talked about with regards the need for more and better park facilities or attractions to be developed to cater to increasingly discerning visitors. It is clear that the full realisation of the eco-tourism potentials of national parks would require the concerted efforts and collaboration of not only park planners and park managers but a host of other stakeholders as well. This paper examines the possible roles and contributions of two (2) important players, namely, tour operators and local communities. It is concluded that the integration of these two (2) players would significantly strengthen the competitiveness and sustainability of national parks as ecotourism destinations in Sarawak.

INTRODUCTION

Overview of Tourism in Malaysia

Tourism is one of the fastest growing sectors of the global economy and developing countries. In Malaysia, the tourism sector has been growing rapidly over the past few years and ranks third as a generator of foreign exchange after oil and gas production. Malaysia has shown a significant increase in tourist arrivals (10%) and tourism receipts (7.8%) over the last 6 years. At the same time, this has also affected the country's earning from foreign exchange; whereby it showed an increase since the last 10 years; from RM17.3 billion in 2000 to RM31 billion in 2005 and RM54.1 billion in 2010.

Recognising that tourism sector can play a role in the economic and social development, huge investments have been made to develop tourism potentials by both the private and government sector. The latter has shown commitment towards tourism development and this has been further demonstrated by the increase in funding and allocations over the years (Cheuk et. al, 2010) through series of Malaysian Plans which amounted to RM5.6 billion (Fourth National Plan to Tenth National Plan).

¹ Sarawak Forestry Corporation

PRODUCTION FUNCTION AND INPUT USE EFFICIENCY IN SAWMILLING INDUSTRY OF SARAWAK

ABDUL WAHAB BUJANG¹

ABSTRACT

The production of sawn-timber comprises the significant portion of output of the timber industry of the State of Sarawak. In the year 2010 the production of sawn timber was respectively 1.1 million cubic meters, Utilising about 2.3 million cubic meters of logs or almost 30 % of the total log input for the downstream timber industry of the State. The study attempts to characterize the level of efficiency of input use in regard to capital and labor, and disaggregating the industry on the basis of geographical regions as to capture any exhibited effects of variations in resource supply situations especially so of logs endowment. The sawn timber of the respective region was regressed with gross capital and labour as independent variables. The returns to scale of both were estimated, employing the Cobb- Douglas Production Function, and then compared on the basis of geographical regions. The findings of study serve as indications of industries' efficiency in input utilisation under various log supply scenario.

INTRODUCTION

The sawmilling industry is one of the major downstream timber-processing in the State of Sarawak, having an average annual employment of about 20,000 people both of local and foreign origins. This industry had been the main source of the growth of the logging industry as well as the development of some timber-based manufacturing activities such production of dowels, wooden-mouldings, block-boards, laminated boards and other minor activities such as furniture in the earlier years of timber industry in Sarawak. Besides, the sawmilling industry has been the major source of foreign exchange, and the current annual export earnings from the exports of sawn timber is about RM 900 million or 12% of the average annual total exports value of logs and timber products from the State of Sarawak.

A total of 39 mills were selected comprising 12 mills from the Kuching Region, 11 mills from the Sibul Region, 10 mills from the Bintulu Region and 6 mills from the Miri Region. The segregation was attempting to capture any possible or discernable variations of efficiency of input use due to variations of regional logs endowment. The sawn timber production of the selected samples or mills from the regions namely Kuching, Sibul, Bintulu, and Miri were regressed against the respective inputs labor and capital. The various coefficients and constants of the estimated production functions of the respective regions provide an indicative efficiency of input use as well as the returns to scales of the saw milling industry of the respective geographic regions.

¹Sarawak Forestry Department

THE PARTICIPATION OF KOPEL BHD AND THE COMMUNITIES IN FOREST RESTORATION

HUSSIN TUKIMAN¹

ABSTRACT

KOPEL Bhd (Batu Puteh Community Eco-Tourism Co-operative) evolving from the MESCOT Initiatives was set up to reverse the losses, to capitalize on ancient indigenous and traditional knowledge and culture, to save and create economic value and appreciation of the mega-diverse rich rainforests of the area, and in the process create a sense of hope for a sustainable future for the people of the Lower Kinabatangan in Sabah. After 10 years of establishment the co-operative has secured tremendous successes in ecotourism, lake restoration as well as forest restoration. Recently, the cooperative has won national award in ecotourism activities. Forest restoration activities undertaken by KOPEL Bhd began in partnership with the Sabah Forestry Department in 1999, where the Sabah Forestry Department has contracted forest restoration in Pin Supu Forest Reserve to KOPEL Bhd. Prior to that the co-operative had successfully planted several species for riparian restoration. These successes however were not gained overnight. The local people have gone through the hardship in procurement of capital, securing trust among members and capacity building. The spirit of empowerment, opportunity, and future hope has already inspired a generation of youth within the villages of Mukim Batu Puteh and hopes to continue to be a guide to the long-term conservation and economic development of the Lower Kinabatangan. This paper focuses on the contribution of KOPEL Bhd. in the development of ecotourism in Kinabatangan and also the participation of the local community in the establishment of KOPEL Bhd. and in forest restoration.

INTRODUCTION

Today, forest restoration of degraded and illegally encroached forest reserve has become one of the main activities in Sabah. The efforts have been intensified particularly in the 9th Malaysia Plan and to be pursued in the 10th Malaysia Plan. Numerous forest restoration projects are being implemented in the State with huge sum of allocations. The allocations are procured from the Federal Government and State Government. There are also donation from financial institution, local and international NGOs and corporate bodies. Sabah Forestry Department is not alone in the endeavor. SFMLA license holders and NGOs are also participating to restore the forests through their own means and objectives.

In Sabah, forest reserve lands have been illegally encroached for various purposes, such as for the cultivation of cash crops particularly oil palm, aquaculture, settlements, and subsistence farming. The area affected is estimated to be approximately 49,000 ha. Apart from that there are also degraded and poorly stocked forest reserves as a result of forest fires and poor logging practices in the past. Sabah Forestry Department is also rehabilitating those areas. Sustainable Forest Management License Agreement holders and NGOs also participated in this effort. It is recorded that until the end of 2010, Sabah Forestry Department has successfully planted lot less than 6,233 ha. The plantings were done through forest restoration and also community forestry project.

¹ District Forestry Officer, Kinabatangan, Sabah Forestry Department

GENERATING ECONOMIC OPPORTUNITY FOR LOCAL PEOPLE THROUGH ECOTOURISM IN LAHAD DATU, SABAH

JURIMIN EBIN¹ AND SITI MASTURAH NORBEH¹

ABSTRACT

Danum Valley Conservation Area (DVCA) is one of the ecotourism oriented locations in Lahad Datu, Sabah. This is known as the world's richest conservation sites and potential to be a world class tourism center. Besides DVCA, others such as Borneo Rainforest Lodge, Tabin Wildlife Holiday Resort, Sahabat Resort Tungku, and more recently Mount Silam are potential ecotourism sites. The methodology used in this study is conducting surveys to appraise the benefits derived from ecotourism to the economies of Lahad Datu, Sabah. Results indicate that the main contributing factor to the local communities is job creation. Local entrepreneurs can generate income through business opportunities such as foods, lodging, and tours and transportation. Ecotourism also brought infrastructural changes, effect on domestic price and sales levels and government revenue. Ecotourism industry will only be considered successful if the resources of ecotourism are not over consumed and the local communities benefitting from them.

INTRODUCTION

Tourism is not a new or recent industry. Tourism has long been viewed as a tool for economic development. Malaysia is recognised globally as one of the leading tourism destinations, ranking top 10 in tourist arrivals and top 15 in global receipts. The tourism industry is also an important contributor to our economy, generating a gross national income of RM 36.9 billion in 2009. This makes tourism the fifth largest industry in the Malaysian economy after oil, gas and energy, financial services, wholesale and retail, and palm oil.

Table 1: Tourist Arrivals and Receipts to Malaysia

TOURIST ARRIVALS AND RECEIPTS TO MALAYSIA		
YEARS	ARRIVALS (million)	RECEIPTS (RM billion)
2010	24.6	56.5
2009	23.6	53.4
2008	22.0	49.6
2007	20.9	46.1
2006	17.4	36.3
2005	16.4	32.0

(Source: Tourism Malaysia)

¹ Jabatan Perhutanan Sabah

HUTAN KOMUNITI KOTA DAMANSARA

BORHANUDDIN ARSHAD¹, WAN ABD. HAMID WAN ABDUL RAHMAN¹
AND AWANG SHAFFIE AWANG AHMADANI¹

ABSTRAK

Kesibukan dan kesesakan hidup di bandar yang serba moden mula dirasai oleh warga kota yang memerlukan refuge bagi ketenangan dan ketenteraman. Pewartaan Hutan Simpan Kota Damansara seluas lebihkurang 300 hektar pada 18 Februari, 2010 membuka lembaran baru dalam sektor perhutanan di Semenanjung Malaysia apabila sebuah kawasan bekas hutan simpan kekal telah diwarta semula untuk pemeliharaan dalam kawasan hutan di keliling oleh pembangunan pesat dan moden. Sebagai antara beberapa kelompok kecil hutan jenis Dipterokarpa Pamah yang masih ada di Negeri Selangor, pewartaan serentak pengelasan hutan sebagai hutan untuk tujuan rekreasi, penyelidikan dan pelajaran menjadi cabaran bagi Jabatan Perhutanan Negeri Selangor untuk mengadakan satu rancangan pelan pengurusan yang komprehensif bagi memenuhi kehendak pelbagai pihak yang berkepentingan (stakeholders) dalam memajukan hutan simpan ini sebagai hutan komuniti moden contoh untuk Semenanjung Malaysia. Kertas ini membincangkan cadangan strategi dan kemungkinan cabaran-cabaran yang bakal dihadapi Jabatan dalam merealisasikan konsep hutan di mana komuniti bandar moden berhubung rapat dengan hutan dalam menjayakan pemeliharaan dan penambahbaikan (enhancement) Hutan Simpan Kota Damansara bagi manfaat rakyat dan negeri.

LATAR BELAKANG

Dalam istilah perhutanan di Semenanjung Malaysia, hutan masyarakat atau komuniti ialah kawasan hutan di mana masyarakat, khususnya masyarakat yang tinggal berdekatan hutan mengambil bahagian dalam aktiviti-aktiviti bagi membangunkan hutan berkenaan demi untuk kepentingan dan faedah bersama agar manfaat ini akan terjamin dan berkekalan.

Hutan komuniti bukan perkara asing di negara ini. Namun begitu pada realitinya, pelaksanaannya selama ini, khususnya oleh Jabatan Perhutanan Negeri lebih menonjolkan peranan Kerajaan dalam memulihkan hutan yang miskin berhampiran kawasan perkampungan agar kawasan ini dapat dielak daripada penerokaan/pembukaan tanah untuk pertanian.

Beberapa definisi hutan komuniti masyarakat antaranya: (i) “Aktiviti perhutanan di peringkat perkampungan, membuat keputusan secara kolektif dan dilaksanakan di atas tanah adat, di mana penduduk tempatan mengambil bahagian dalam perancangan, penubuhan, pengurusan dan penuaian tanaman hutan, dan sebagainya. Masyarakat menerima sebahagian besar manfaat sosio-ekonomi dan ekologi dari hutan.” - *Martel & Whyte(1992)* dan; (ii) ”Satu proses yang meningkatkan penglibatan dan ganjaran bagi masyarakat setempat, ke arah mencapai keseimbangan antara kepentingan luar dan kepentingan masyarakat dan meningkatkan tanggungjawab masyarakat setempat dalam pengurusan sumber hutan” – *Alistair Sarre (1990)*.

¹ Jabatan Perhutanan Negeri Selangor

5.3 Plenary Session 3

FOREST AND CLIMATE CHANGE

(Perubahan Iklim dan Hutan)

GREEN ECONOMY FROM THE PERSPECTIVE OF SARAWAK'S HEART OF BORNEO INITIATIVE

HAMDEN HJ MOHAMMAD¹ AND MICHAEL NGELAI²

ABSTRACT

The momentum for building a global green economy is growing. Spurred on by the needs to curb greenhouse gas emissions, use resources more efficiently, provide long-term sustainable increases in GDP and standards of living and to value the often invisible natural assets that have underpinned economic success over the centuries. The green economy is about improving prosperity in environmentally friendly and socially inclusive way. National responses to the green economy opportunity vary. For some countries, green growth is primarily about the natural environment, whilst for others it is largely an issue of urbanization. The Heart of Borneo Initiative is a trilateral commitment between Brunei, Malaysia and Indonesia. This initiative aims to deliver ecologically and economically viable solutions for the preservation of critical ecosystems in the Heart of Borneo (HoB), through a balanced mix of protected areas, sustainably-managed forest and green economic development. These are reflected in the Heart of Borneo Trilateral Declaration signed in February 2007. A green economy in the Heart of Borneo (HoB) could help deliver the objectives set out in the Declaration, but also support goals such as economic growth, poverty alleviation and energy and food security. Green economy activity, such as renewable energy generation, bio-prospecting, eco-tourism, forest carbon and ecosystem service markets and sustainable agriculture and forestry could also attract foreign investment from both the public and private sector and improve the quality of the environment and the well-being and the prosperity of local inhabitants.

INTRODUCTION

The Concept of Green Economy

The green economy has become a major theme of the Rio+ 20 conference to be held next year in Brazil to commemorate the 20th anniversary of the historic United Nation conference on the environment and development, better known as the Rio Summit, held in 1992.

The green economy is emerging as a significant concept, though also a controversial one that will be part of the international environmental debate this year. At first glance, the green economy appears to be a simple idea whose time has come. Surely we all want to conserve natural resources and minimize pollution and greenhouse gas emissions. What better way than to turn the economy green? There is, however, no scientific agreement yet on how to achieve a green economy, nor is there an international consensus on what it means and how to move towards it.

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GROUND SURVEY FOR ABOVEGROUND BIOMASS ESTIMATION AT DERAMAKOT FOREST RESERVE, SABAH

ESTHER DYI KA MEI¹ AND JUPIRI TITIN¹

ABSTRACT

Estimation of aboveground biomass (AGB) is an essential aspect in the studies of forest such as, forest health, forest production, forest ecology, carbon stock estimation and also a useful tool for comparing structural and functional attributes of forest ecosystem. The aim of this study is to estimate AGB by using Site Based Measurement method at Deramakot Forest Reserve (DFR), Sabah. A total of 62 research plots were established. The methodology includes measuring trees with more than 10cm dbh and the species were also identified. Estimation of AGB of individual tree was done using an allometric equation developed by Brown (1997). Stratum 1 shows the highest average of AGB with 544 t/ha, followed by Stratum 2 with an average AGB value of 378 t/ha. The average AGB value for Stratum 3 and 4 were 350 t/ha and 250 t/ha respectively. In terms of floristic composition, from out of 3900 individual stands recorded from this study, the total number of Families recorded was 55, with 121 genera. The top ten leading Families are Dipterocarpaceae, Euphorbiaceae, Lauraceae, Sterculiaceae, Anacardiaceae, Myrtaceae, Leguminosae, Sapotaceae, Myristicaceae and other Families. The Dipterocarpaceae has the highest AGB with a record of 57.5%. Several factors, such as tree diameter classes, number of individual stands might have contributed to the differences in the AGB density. Site based measurement method (ground survey) is accurate compared to remotely sensed data method in estimating AGB. In addition, the AGB data can be converted into carbon value to estimate carbon stock.

INTRODUCTION

Forest plays an important role for our environmental, social and economic benefits. In the year 2001-2009, timber from forest contributed the average annual revenue of RM 400.49 million for the Sabah State Government. In social aspect, the community dwelling in the rural areas of Sabah still depends on forest products for livelihood. The forest ecosystem is an essential component of the global carbon cycle, acting as a reservoir for storing carbon. Any forests converted into other land uses will cause the net loss of carbon stock since forested area sequestered more carbon than in the non-forested area.

The poor management of the forest in the past had caused a huge area of forest being deforested. According to the report of Second National Communication to the UNFCCC, deforestation contributes 14% of CO₂ emission or 13% GHG gas emission. FAO (1999) also reported that an estimated 13 million ha of tropical forest is lost each year to deforestation. Deforestation includes activities such as land use conversion (from forest to other land uses) and clear felling practices. Besides deforestation, our forest areas are also being degraded from other activities such as forest fires and shifting cultivation by the rural community.

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THE LONG AND BUMPY ROAD TO REDDINESS - WHY BOTHER?

FREDERICK KUGAN¹ AND HEIDI HENRY WILLIAM¹

ABSTRACT

Sabah has a long history of carbon related projects since 1992 with projects such as Innoprise- Face Foundation (INFAPRO) and the New England Electric Services (NEES). Throughout these two decades of involvement, much of the efforts had focused on understanding the sciences of carbon responses to forest economy or growth, and best forest practices. Unfortunately, given the stringent requirements for forest / CDM projects, and coupled with the priority of the national government on forest carbon, none of these projects have either qualified or developed into real transactions of carbon money. Scepticism on the prospects deepens. The adoption of REDD+ concept in the COP15 of the United Nations Framework Climate Change Convention (UNFCCC) in Copenhagen 2009, had somehow offered some light in the tunnel. It broadens up the scope for carbon projects to include many aspects of Sustainable Forest Management (SFM) in addressing deforestation and most importantly enhancing carbon through many of the activities, which have been experimented in Sabah. While the discussion and the development of REDD+ is now on the table, the State of Sabah has embarked on its own REDD+ Strategy, in an effort to prepare Sabah for eventual REDD+ development. This paper discusses the strategy and offers some insights into the prerequisites for a smooth journey to realising REDD+ in Sabah.

INTRODUCTION

Sabah has a long history in experimenting into carbon related projects and has also been following closely the development of carbon and climate change related agenda. The messages or signals that we have received particularly in the more recent high level climate talks, from Bali to Copenhagen, seem to point towards outcomes that augur well for high forest nations for having a broader role in addressing climate change.

The Bali Action Plan¹, which was introduced at the 13th Conference of Parties (COP 13) of the United Nations Framework Climate Change Convention (UNFCCC), acknowledges the contribution of the emissions from deforestation to global anthropogenic greenhouse gas emissions, and that forest degradation also leads to emissions, and needs to be addressed when reducing emissions from deforestation. And subsequently, the Copenhagen Accord², which was adopted at the 15th COP of UNFCCC, had accepted the scope of REDD-plus in mitigating climate change to include activities leading towards:

- i. Reducing emissions from deforestation
- ii. Reducing emissions from degradation
- iii. Conservation of forest carbon stocks
- iv. Sustainable management of forests, and
- v. Enhancement of forest carbon stocks.

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FOREST RESTORATION FOR FMU 10 TRUS MADI FOREST RESERVE: ISSUE AND CHALLENGES

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ABSTRACT

Forest restoration programme and activities are planned on burnt and encroached areas of FMU10 Trus Madi FR which has been devoid of its ability to regenerate naturally. An area of approximately 22,000 hectares of these severely degraded areas are identified in the southern flank of Trus Madi FR and earmarked as zone 3 (Restoration/Rehabilitation Zone). These areas are located in the Keningau forestry district. Restoration works on few selected compartments have been implemented with the introduction of various indigenous species covering an area of 1,160 hectares. These areas are almost barren with only the pioneer trees and various fern plants harboring the areas. This paper will deliberate on why restoration component is important, current work done, issues and challenges faced in implementing this restoration programme.

Introduction

Much of Sabah's forests have been logged or burnt, leaving behind a degraded forest with various levels of disturbances and ability to regenerate. There are also illegally encroached cultivated lands in forest reserves planted with various short and long term agricultural crops which need to be restored. Aware of this, the Sabah Forest Department has identified forest restoration and rehabilitation efforts as an important element in Sustainable Forest Management of Sabah's Forest Reserves. One of the many restoration projects undertaken in Sabah is a restoration project implemented at Forest Management Unit or FMU 10 Trus Madi Forest Reserve.

FMU 10 Trus Madi Forest Reserve is a conservation area, situated at the central of Sabah with a total acreage of 74,736 ha (Figure 1). It is part of the larger Trus Madi Forest Reserve that extended over a total area of 175,897 ha. The FMU 10 is bordered by three (3) state administrative as well as forestry districts and a state sub-district, namely, Tambunan on the west, Keningau on the south, Ranau on the north and Sook on the east. Out of the total area of 74,736 ha, the Keningau Forestry District administered 47,772 ha of the area, while the remaining 27,964 ha are within the Tambunan Forestry District's jurisdiction. Logging Licences had ceased to be issued since 2002.

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PERANAN JABATAN PERHUTANAN NEGERI PAHANG (JPNP) DALAM MENANGANI PERUBAHAN IKLIM: PROJEK PERINTIS BERSAMA PIHAK SWASTA MELALUI PROJEK ‘VOLUNTARY CARBON OFFSET SCHEME’ (VCOS)

ABDUL KHALIM ABU SAMAH¹ AND DR. ISMAIL PARLAN²

ABSTRAK

‘Voluntary Carbon Offset Scheme’ (VCOS) merupakan inisiatif Syarikat Penerbangan Malaysia (MAS) bagi menangani kesan perubahan iklim. Program ini merupakan satu usaha kerjasama yang sangat inovatif di mana ia melibatkan pelbagai agensi seperti Kementerian Sumber Asli dan Alam Sekitar (NRE), Institut Penyelidikan Perhutanan Malaysia (FRIM), Jabatan Perhutanan Negeri Pahang (JPNP) dan pihak swasta iaitu Syarikat Penerbangan Malaysia (MAS). Sebagai kesinambungan kepada satu projek antarabangsa yang telah dibiayai oleh UNDP/GEF pada tahun 2004-2008, Kerajaan Negeri Pahang melalui JPNP telah memilih kawasan Hutan Paya Gambut Pahang Tenggara (South East Pahang Peat Swamp Forest) sebagai tapak projek VCOS ini. Sebagai permulaan, JPNP telah memperuntukan kawasan seluas 100 ha di Hutan Simpanan Kekal (HSK) Pekan (Tambahan) untuk pelaksanaan projek ini. Kawasan ini yang pada asalnya merupakan Tanah Kerajaan tetapi atas inisiatif JPNP ianya telah diwartakan sebagai HSK. Majlis pelancaran projek VCOS ini telah selamat dilaksanakan pada 10 Mac 2011. Semasa pelancaran ini sebanyak 924 pokok telah ditanam yang terdiri dari 426 pokok Ramin melawis (*Gonystylus bancanus*) dan 426 pokok Mersawa paya (*Anisoptera marginata*). Keputusan awal iaitu selepas 6 (enam) bulan ditanam, peratus kehidupan adalah sebanyak 75.23%. Inisiatif projek ini diharapkan dapat menggalakkan lebih banyak aktiviti ‘offset’ karbon oleh syarikat swasta padamasa hadapan di samping dapat membentuk kerjasama erat antara pihak swasta dengan pihak awam di dalam menangani perubahan iklim dunia. Projek ini juga diharap dapat meningkatkan tahap kesedaran awam terhadap isu-isu berkaitan dengan perubahan iklim serta menggalakkan penglibatan orang awam dalam menangani perubahan iklim dan pelepasan karbon.

LATARBELAKANG

Isu perubahan iklim kini menjadi agenda utama bagi negara-negara di dunia. Menurut Laporan Penilaian Keempat oleh *Intergovernmental Panel on Climate Change’s* (IPCC), perubahan iklim yang sedang berlaku adalah disebabkan oleh aktiviti-aktiviti manusia. Aktiviti manusia ini telah mengubah komposisi dan meningkatkan ketebalan lapisan Gas Rumah Hijau (*Greenhouse Gases* – GHG), sekaligus memerangkap haba yang dibebaskan oleh bumi ke satu tahap yang memudaratkan. Walaupun Malaysia merupakan negara yang sedang membangun dan tidak menyumbang kepada permasalahan ini, namun sebagai sumbangan negara di peringkat antarabangsa, Malaysia ingin membantu mengikut kemampuan dalam mengurangkan pelepasan GHG ke atmosfera.

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MANAGING PEAT SWAMP FORESTS OF SELANGOR: IS IT WORTH IT?

YUSOFF MUDA¹, BORHANUDIN ARSHAD²,
WAN ABDUL HAMID SHUKRI WAN ABDUL RAHMAN¹,
MANGSOR MD YUSOF¹

ABSTRACT

Global warming and climate change have shifted attention towards the importance of conserving and preserving natural forests. This awareness is no exception in Selangor, the most developed state in Malaysia which houses about 31.5% of these resources. One particular forest type, the peat swamp forest, functions effectively as carbon stocks, water controller and fire preventer. With peat swamp forests making 1/3 of the permanent reserved forests, their contribution towards the social, economic and environmental balance of the state is under threat due to the enormous pressure of development. Peat swamp forest degradation is another setback. This paper discusses the issues and threats of managing and rehabilitating peat swamp forests particularly in permanent reserved forests of Selangor and the current efforts and program undertaken and challenges foreseen in ensuring its continuous survival and existence for the well-being of the state.

INTRODUCTION

Selangor has declared herself as the first developed state in Malaysia since 2005, meaning that it has put herself indirectly on par with other developed countries in the world. This declaration came with a well-defined policy on the state's land use, setting aside at least 30% of its land use as forests, particularly to remain or be gazetted as Permanent Reserved Forest (PRF). The policy is parallel with the state's Sustainable Development Strategy 2000 that emphasized on environmental perpetuity that can be achieved through protecting and conserving forests.

As of 31st December, 2010, Selangor has 250,128 ha of PRFs which represents more than 30% of its land use. There are three major forest types in Selangor i.e. Inland forest, mangroves and the peat swamp forests (PSF). In terms of the major forest types to be conserved, the government's policy has never specifically stated the acreage of PSF to be established as PRF to achieve the said target. However, the Selangor State Structure Plan gazetted in 2007 has categorized PSF as Environmentally Sensitive Areas (ESA). Current statistics showed that more than 1/3 of the PRFs are PSF where its distribution are spread widely apart at two main locations, the north, consisting an area of $\pm 77,736$ ha known as the North Selangor Peat Swamp Forest (NSPSF) and the south with an area of $\pm 9,298$ ha known as the South Selangor Peat Swamp Forest (SSPSF) as shown in **Table 1**. The total acreage of $\pm 86,634$ ha is the second largest portion of PSF in Peninsular Malaysia by a state, after Pahang.

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5.4 Plenary Session 4

FOREST BIODIVERSITY AND CONSERVATION

(Pemeliharaan Dan Biodiversiti Hutan)

WILDLIFE MONITORING AND RESCUE OPERATION AT BAKUN HEP FLOODED ZONE

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JULIA SANG¹, MHD SAMSUDIN B. MHD SURI², AND
SIRAJUDDIN SALLEH²

ABSTRACT

Sarawak Forestry Corporation Sdn. Bhd. started to implement the wildlife monitoring and rescue operation at Bakun HEP flooded zone in May 2009 after the letter of acceptance was signed by the Managing Director/Chief Executive Officer (MD/CEO) of Sarawak Forestry Corporation Sdn. Bhd. Wildlife monitoring and rescue operation (WiMOR) activities were divided into three parts namely; pre-impoundment activities, activities during impoundment and post impoundment activities. Pre-impoundment activities included—reconnaissance and preparatory visit, installation of communication facilities, construction of floating camp, base camp (nursery and animal holding areas), floating store and pontoon, fauna and flora inventory, plants collection and rescue, purchasing of relevant equipment, maintaining of floating camp, floating store and plants nursery. Activities during impoundment comprised of animals and plants rescue. Post impoundment activities comprised of animals monitoring and relocation of rescued seedlings. Two approaches were used for fauna rescue, namely active rescue and passive rescue. Plants rescue comprised of herbarium collection, living specimens and seeds collection. Target areas were 50 km² flooded zone from Bakun Dam. A total of 1,527 individuals comprising 47 species of mammals, 15 species of birds and 22 species of reptiles were rescued and released at four areas which connect to the proposed Batu Laga NP and the proposed Hose Mountain NP. These areas are Sg. Wat (Murum areas), Sg. Kemensan (Balui areas), Bukit Tempuring (Linau areas) and Sg. Bersuar (Balui areas). All these areas are connected to the mainland. A total of 33,715 plant seeds were rescued and successfully germinated at the nursery. Most of these seedlings were from timber species such as Ensurai, Tegelam, Meranti, Rengas, Resak, Engkabang, Binatoh, Luis and Urat Mata. These seedlings had been successfully relocated or transplanted to specific areas according to the planting plan. For herbarium specimens, a total of 79 families were collected and brought to Kuching and for living collection, a total of 73 families were collected and raised at the Bakun nursery.

INTRODUCTION

In early May 2009, Sarawak Forestry Corporation Sdn. Bhd. (SFC) and Sarawak Hidro Sdn. Bhd. (SHSB) agreed to collaborate in an effort to rescue wildlife stranded in the island or trapped in flooded areas. Both parties agreed to manage and rescue priority wildlife species affected by BHEP in line with, and acceptable to the international standards and practices and NREB requirement as per clause 6.2 of the Revised Term and Conditions for Environment Protection and Enhancement in respect of the Reservoir Preparation

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MINERAL LICKS AND ITS RELATION TO WILDLIFE CONSERVATION

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ISHAK HASHIM¹ AND ANUAR BUJANG¹

ABSTRACT

Mineral licks are unique places in the forest of LanjakEntimau Wildlife Sanctuary where several species of non-volant mammal and bird species drink water from small puddles, likely for mineral supplementation. In our study, a total of 23,436 hours of direct observations were accumulated representing of 4 mammals and 1 bird species. From the camera traps total of 19,770 photographs were obtained representing of 8 mammals' species. The most frequent visitor was *Cervus unicolor* followed by *Sus barbatus*, *Muntiacus muntjac*, *Presbytis rubicunda*, *Pongopygmaeus*, *Hystrix brachyura*, *Chalcophaps indica*, *Trichys fasciculata* and *Helarctos malayanus*. However, there is considerable temporal and spatial variation in lick use both within and among species. Mineral licks visitation by the species is strongly female biased and in particular to reproductive females. Mineral licks had higher content of Cu, Fe, Mn, Ca, Mg, Zn, K, Na and P indicates that mineral licks serve to mineral supplementation, in balance of specific elements and to mitigate against intestinal ailments associated with forage phenology. Therefore, mineral licks are important components in the ecology of many different species. As a consequence, mineral licks play a crucial role in maintaining populations of species and hence the overall diversity. Thus, mineral licks are fundamental to population existence and must be considered as important conservation tool.

INTRODUCTION

Sodium (Na) is one of the most limiting nutrients to vertebrate in the tropics where leaching depletes it from soil (Emmons & Starke 1979; Stark 1970). Because most plants do not require it, they contain low sodium (Wendeln et al. 2000) perhaps as deterrent against herbivory (Morris 1991). Consequently, frugivores species may face sodium constraint especially during reproduction (Michell 1995). Calcium (Ca) is essential for milk and bone production but it is usually limited during reproduction (Booher 2008; Kwiecinski et al. 2003; Bernard & Allen 1997). Although some species may consume calcium-rich fruits (Wendeln et al. 2000) the amounts acquired may not be sufficient for reproduction (Barclay & Harder 2003). Other than Na and Ca, magnesium (Mg) and Potassium (K) are also essential minerals for vertebrates. Mg provides strength to bones facilitates enzyme activity and is needed for nucleic acid and protein synthesis (Morris 1991). K is important in nerve conduction, muscular contraction and in osmotic water balance (Morris 1991). As a contrary to Na and Ca, herbivores and frugivores species seem to obtain adequate amounts of Mg and K from their diets (Wendeln et al. 2000) but the demands of those nutrients during reproductive increased make mineral licks are reliable sources.

Since mineral licks may have more than one function for wildlife species and those functions may vary across species, mineral licks may represent a resource ecological importance goes beyond the particular benefits for individual species (Montenegro 2004).

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TOWARDS THE IMPLEMENTATION OF PLANT CONSERVATION STRATEGY FOR RARE AND ENDEMIC SPECIES IN SABAH: A HEART OF BORNEO (HoB) INITIATIVE

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ABSTRACT

For the past three years, the Sabah Forestry Department under the auspices of the Heart of Borneo Programme, has conducted several scientific expeditions to selected protected areas in Sabah. The objectives of these scientific expeditions were, among others to assess the plant diversity and their conservation status in various protected forest reserves of different habitat types that are affected by various fragmentation and connectivity issues. From these plant inventories, important key conservation target species can be highlighted in the conservation management plan of the protected area for monitoring purposes in order to safeguard the integrity of the forest and well-being of the surrounding protected area. Thus far, the surveys have discovered that forests on ultrabasic substrates are unique and interesting habitat types because they harbour a myriad of endemic and rare flora that need special attention. Noteworthy is the documentation of five taxa that are confined to only one habitat or locality (hyper-endemics), and all of them are only recorded from ultrabasic habitats. Bukit Tawai Forest Reserve (FR) has been identified as having the highest number (three species and one subspecies) of hyper-endemics which include *Rhododendron sugaii* Argent, *Semecarpus angustifolius* Kochummen, *Syzygium soepadmoi* P.S. Ashton and *Tristaniopsis merguensis* subsp. *tawaiensis* P.S. Ashton, while Bukit Hampuan with one hyper-endemic, i.e., *Pittosporum linearifolium* J.B. Sugau. In line with the Malaysia National Strategy For Plant Conservation (MNSPC), it is a prerequisite in the conservation management plan to outline the conservation strategies of these high conservation value species. The challenges and recommendations in implementing the national strategy for plant conservation of the rare and endemic species in Sabah are discussed.

INTRODUCTION

The Heart of Borneo (HoB) initiative completed its second year of implementation since the declaration by the three countries i.e., Brunei Darussalam, Indonesia and Malaysia that was signed in Bali, Indonesia on 12th February 2007.

Project Document (PD) or Strategic Plan of Action (SPA) for Sabah's component under the HoB initiative was formulated in 2008. The HoB's agenda was further proposed under the 9th Malaysian Plan with the view to realize the three main priorities as follows:

- i. maintenance of forest connectivity through the strengthening of the Protected Area Network;
- ii. establishment of sustainably managed forested corridors connecting these areas; and
- iii. the opportunity to enhance transboundary cooperation.

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THE RAINFOREST DISCOVERY CENTRE'S CONTRIBUTION TO ENVIRONMENTAL EDUCATION IN SABAH

BERNADETTE D JOEMAN¹ AND GEORGE HUBERT PETOL¹

ABSTRACT

The Rainforest Discovery Centre or RDC is an environmental education (EE) centre managed by the Sabah Forestry Department. It is perhaps the most active EE centre in Sabah. In the past few years, the RDC receives about 52-55 school visits a year and almost every group experience customised environmental education programme. The RDC is also the main organiser of EE training for teachers in the east coast of Sabah. Since 1998, RDC has trained about 770 school teachers in EE. In the early 2000s, the RDC was active in establishing a network of EE practitioners. It proposed the idea in the first Seminar on Environmental Education for Practitioners (SEEP) in 2002. In 2005, the Sabah Environmental Education Network (SEEN) was formed; an endeavour led by the Environment Protection Department which is currently the Secretariat for SEEN. The RDC opened its doors to visitors in 2007 with the aim to be the first government-run EE centre to be self-financing. Many facilities have been built to attract visitors and to provide them with an educational experience. This paper mainly outlines the contributions of the department in the enhancement of EE in Sabah through the RDC.

INTRODUCTION

The Rainforest Discovery Centre (RDC) is principally an environmental education (EE) situated at the edge of the 4,400-ha Kabili-Sepilok Virgin Jungle Reserve, about 25 km west of Sandakan town. It is managed under the Natural Forest Management Programme at the adjacent Forest Research Centre, the R & D division of the Sabah Forestry Department (SFD).

The RDC is best known in Sabah for its EE programme. With a recorded 403 visits by 27,556 children since 1997, it is probably the most visited EE centre in Sabah. Through its teacher training courses conducted since 1997 with more than 770 teachers trained in EE, it also has a very close rapport with the Sandakan District Education Office and with most schools in and around the Sandakan District. This rapport has resulted in many schools being very environmentally aware within the district and this situation is evident by the numerous state-level, national and international recognitions awarded to a number of schools in the district.

Amongst EE practitioners (governmental and non-governmental) in Sabah, the RDC is also regarded as a resource for capacity-building and trainings in EE, mainly concerning environmental interpretation, skills in organising events/activities, park management, designing educational exhibitions and conducting EE activities. Many present EE practitioners would have had undergone at least one training course by the RDC.

¹Rainforest Discovery Centre, Forest Research Centre, Sabah Forestry Department

EKSPEDISI SAINTIFIK KEPELBAGAIAN BIOLOGI HUTAN JPSM: SEJAUH MANAKAH RELEVANNYA?

MUHAMAD ABDULLAH¹, NOR HASLIZA MOHD BOKTI¹ AND
REGINA MARIAH JONG¹

ABSTRAK

Malaysia adalah di antara negara yang mempunyai khazanah hutan yang tidak ternilai, malah negara kita juga diiktiraf sebagai salah satu daripada 12 buah negara “mega-kepelbagaian biologi” di dunia. Menyedari hakikat ini, Jabatan Perhutanan Semenanjung Malaysia (JPSM) telah mengadakan usaha pemuliharaan hutan yang berterusan khususnya terhadap kepelbagaian biologi hutan di Semenanjung Malaysia. Salah satu daripada usaha berterusan yang dilaksanakan oleh JPSM ialah penganjuran Ekspedisi Sainifik Kepelbagaian Biologi Hutan. Sepanjang tahun 1999 hingga 2011, sebanyak 23 siri ekspedisi telah dianjurkan oleh JPSM dengan kerjasama pakar-pakar kepelbagaian biologi hutan dalam pelbagai disiplin dan hasilnya sejumlah penemuan signifikan telah direkodkan di Semenanjung Malaysia yang memberi manfaat bukan sahaja kepada pihak JPSM, malah Pihak Berkuasa Negeri, Institusi Pengajian Tinggi dan orang awam. Kertas kerja ini mengupas beberapa isu dan permasalahan serta membincangkan halatuju berkenaan dengan penganjuran ekspedisi saintifik JPSM dalam usaha untuk memastikan sumber kepelbagaian biologi hutan negara kita sentiasa terpelihara.

PENDAHULUAN

Malaysia merupakan sebuah negara yang terletak pada garisan khatulistiwa menerima taburan hujan sepanjang tahun. Kedudukan ini telah menjadikan landskap negara ini unik dengan pelbagai jenis flora dan Hutan Hujan Tropika merupakan satu ekosistem yang sangat kompleks dan menjadi tempat perlindungan kepada lebih 17,254 spesies tumbuhan yang merangkumi 15,000 tumbuhan berbunga (flowering plants), 195 palma (palms), 500 orkid (orchids), 1,159 paku-pakis (ferns) dan 400 fungi. Manakala, bagi kepelbagaian hidupan liar atau fauna pula, Malaysia mempunyai kira-kira 286 spesies mamalia, lebih daripada 150,000 spesies invertebrata, 1,000 spesies kupu-kupu (butterflies), 12,000 spesies rama-rama (moths), lebih daripada 4,000 spesies ikan laut (marine fishes), 449 spesies ikan air tawar, 158 spesies amfibia, 268 spesies reptilia dan 736 spesies burung (A. Latiff Mohamad et al., 1997).

¹Jabatan Perhutanan Semenanjung Malaysia

KAJIAN *IN-SITU* TERHADAP TABURAN TUMBUHAN UBATAN DAN HERBA DI HUTAN ASLI SEMENANJUNG MALAYSIA

KAMARUZAMAN, A. B¹. DAN NOR HAFIZAH, M.²

ABSTRAK

Kajian taburan tumbuhan ubatan dan herba telah dijalankan di lima (5) petak Hutan Simpan Kekal iaitu; HS Pasir Raja, Terengganu; HS Gunung Jerai, Kedah; HS Panti, Johor; HS Chabang Tongkat, Kelantan dan Taman Negeri Endau Rompin, Pahang. Setiap petak berkeluasan 20 ha dan bancian taburan tumbuhan ubatan dan herba telah dijalankan seluas 2.0 ha merangkumi 10% keluasan setiap petak. Hasil dari bancian yang dijalankan, sejumlah 514 individu tumbuhan ubatan dan herba telah direkodkan yang mewakili 97 famili dan 422 spesis. Famili Zingiberaceae mendominasi taburan bagi tiga (3) petak kajian iaitu di: HS Pasir Raja, Terengganu, HS Gunung Jerai, Kedah dan HS Panti, Johor. Manakala famili Annonaceae mendominasi HS Chabang Tongkat, Kelantan dan famili Rubiaceae mendominasi petak di Taman Endau Rompin, Pahang. Tumbuhan ubatan dan herba yang direkodkan adalah terdiri daripada pelbagai cara hidup seperti epifit, herba, menjalar, pokok renek, pokok dan pepanjat.

PENGENALAN

Di Semenanjung Malaysia, kawasan berhutan termasuk Hutan Simpan Kekal (HSK) amat kaya dan merupakan gedung asli bagi tumbuhan ubatan dan herba yang telah dikenalpasti memberi sumbangan telus kepada nilai-nilai ekonomi dan memberi manfaat kepada masyarakat serta industri berasaskannya. Malaysia diwakili hampir 15,000 spesis tumbuhan berbunga manakala paku-pakis melebihi 1,170 spesis (Parris dan Latiff, 1997) dan 1,300 spesis adalah mempunyai nilai-nilai perubatan serta merupakan bahan mentah bagi menyokong industri pemprosesan bagi pengeluaran pelbagai barangan. Industri berasaskan sumber ini mengalami kadar pertumbuhan antara 15 – 20 % setahun dengan nilai perdagangan sebanyak RM4.5 billion.

Mengikut Pertubuhan Kesihatan Sedunia (WHO), 80 % penduduk dunia bergantung kepada perubatan tradisional yang dihasilkan daripada tumbuhan untuk keperluan kesihatan dan mengubati penyakit (IUCN et al. 1994). Bagaimanapun, keprihatinan terhadap berkurangnya populasi, kehilangan kepelbagaian genetik, kepupusan dan kerosotan habitat akan memberi kesan kepada kewujudan tumbuhan ini secara berterusan. Dalam mengimbangi kadar permintaan serta bekalan sumber asli ini, Perhimpunan Ke-41 Kesihatan Sedunia (the Forty-first World Health Assembly, Chiang Mai, Thailand, 1988) telah membuat ketetapan supaya masyarakat dunia perlu meningkatkan kesedaran serta bekerjasama dalam meningkatkan usaha-usaha memelihara serta menggunakan dengan sebaik-baiknya tumbuhan ubatan dan herba sebagai sumber asli yang boleh diperbaharui supaya tidak berlaku kepupusan.

1 Ketua Penolong Pengarah Kanan, Bahagian Ladang Hutan dan Perlindungan Hutan, JPSM

2 Penolong Pegawai Ladang (Baik Biak dan Biak Bakaan Pokok) Bahagian Ladang Hutan dan Perlindungan Hutan, JPSM

AN EARLY ASSESSMENT OF NATURE LIVE SITES UNDER MALAYSIA MEGA BIODIVERSITY HUB (MMBH)

MOHD JINIS ABDULLAH¹, SHASHIAH ABDUL KARIM¹ AND SAMSUDDIN SALLEH¹

ABSTRACT

Malaysia is recognised as one of the world's top tourism destinations. Tourism is the fifth largest industry, generating RM37 billion in GNI in 2009. Ten percent of total tourist arrivals into Malaysia are nature base and ecotourism-related. Blessed with abundance, very unique and magnificent biodiversity, Malaysia aims to become one of the best presenters of biodiversity in the world. The Government through the Economic Transformation Programme has identified several biodiversity sites of international caliber to be accredited and upgraded into world class tourism destinations. These sites will predominantly attract high end tourists and Malaysia can expect to obtain higher yields from tourists to these key sites,. This is in line with the government aspiration in creating new wealth for the country. The net-working of these sites is named as **Malaysia Mega Biodiversity Hub (MMBH)**. These sites will be managed by their individual management bodies, and must maintain the expected level of excellence or risk losing accreditation. This is an effort towards developing Malaysia into one of the world's premium ecotourism destinations; ensuring standards of excellence in product packaging, service delivery and sustainable use; and to empower rural communities to help them move up the value chain. This paper will focus on a few lives sites that had been assessed and the results of the assessment. It was found that some of these lives sites have quality services and offerings that is of international caliber. Concerted effort and hard work is required to enhance them further.

INTRODUCTION

The Prime Minister of Malaysia in March 2010 had launched the New Economic Model (NEM) to transform Malaysia into a high income nation by the year 2020. To realise NEM, the government have embarked on an Economic Transformation Programme (ETP) to propel the economy to 2020. The Performance Management and Delivery Unit (PEMANDU) in the Prime Minister Office is the lead agency to orchestrate the ETP. The implementation of ETP is expected to bring about concrete changes in specific sectors and areas of the economy.

To drive the ETP, a workshop was facilitated by PEMANDU to seek national consensus on specific economic sectors that the nation can focus on to increase Gross National Income (GNI) from US 7,000 to US 15,000 in the year 2020. A Thousand Person Workshops was convened in May 2010. The participants in the workshop were leaders from the public and private sectors, research institutions and civil society. The workshop was to prioritise the key sectors of growth for Malaysia until 2020 and had selected 12 National Key Economic Areas (NKEAs). The NKEAs were selected based on their expected contribution to GNI in 2020, and above that these sectors currently contributed about one-third of the nation's GNI.

¹ Forestry Department Peninsular Malaysia

5.5 Plenary Session 5

INNOVATIONS AND R&D IN FORESTRY

(R&D Dan Inovasi Dalam Perhutanan)

INNOVATIVE EMPOWERMENT OF LOCAL COMMUNITIES FOR SUSTAINABLE FOREST MANAGEMENT IN SARAWAK

SAPUAN AHMAD,¹ HENRY CHAN² AND WONG ING YUNG³

ABSTRACT

The participation of local community in forest management is considered to be a prerequisite for sustainable conservation and management of forests. It implicitly leverages the social capital and knowledge of the community to determine conservation values and management system of an ecosystem. This paper describes an innovative approach to the empowerment of local communities for the attainment of effective community forest management at the Anap-Sustainable Development Unit in Sarawak. Noteworthy elements of this approach include a consultative institutional and support framework, the bequest of an area to establish a forest plantation through provision of permits/license to the local community for restoration of degraded areas, and capacity building for entrepreneur development.

INTRODUCTION

Background

The birth of the 7th billion people this year is an apt reminder of rapid changes affecting land use on planet Earth. In Sarawak, community land use to support traditional livelihood based on shifting agriculture had expanded from 1.6 million hectares in 1958 to 3.2 million ha today. While shifting agriculture commonly known as shifting cultivation or swidden farming had traditionally utilised land along river valleys, the development of forest industry and associated logging road infrastructure has contributed to clearing of high forests for new settlements and farming.

Overtime, community-cleared land inevitably results in conflict with designated land uses for national and regional development programmes. This includes the 6 million ha under Permanent Forest Estate (PFE) and 1 million ha of Totally Protected Areas (TPA). Estimates indicate that some 2.8 million ha (46.7%) of PFE and areas under Licence for Planted Forests (LPF) have been degraded by this cleared land. Clearly, an innovative, sustainable and acceptable solution is needed to address this expansion of land clearance in the forested areas.

We suggest Community Forest Management as an innovative means to engage with local community to address the conflict between conservation needs and community development in areas designated for sustainable forest management in Sarawak.

¹ Forest Department Sarawak

² Sarawak Forestry Corporation

³ Zedtee Sdn. Bhd.

UTILISING TRICHODERMA SPECIES FOR ENHANCEMENT OF PRODUCTIVITY IN FOREST PLANTATION

A. AMBROSE¹, A JULAIHI¹, R.A HILL² AND F. AGBAYANI³

ABSTRACT

Huge investments required for establishment of forest plantation call for effective R&D particularly to support control of disease and to enhance growth rate. The introduction of *Trichoderma* species isolated from roots of various healthy plants is one such R&D effort carried out by Sarawak Forestry Corporation, Bio-protection New Zealand and Grand Perfect Sdn. Bhd. This paper describes the nursery trials of application of *Trichoderma* in the Planted Forest Zone (PFZ), Sarawak to study the growth response of *Acacia mangium* seedlings and to assess the potential of *Trichoderma* as a biological control agent for root rot disease. Results showed that application of *Trichoderma* increased seedling growth and health, and the proportion of seedlings meeting the specifications for planting out in the field increased by more than 60% i.e., an increased production of 30 million to 48 million seedlings annually compared with the standard nursery practice. This translates to a saving of RM 4.5 million for the industry with a conservative cost of RM 0.25 per seedling. The potential of *Trichoderma* as a biological control for root rot disease is also being explored in this study with preliminary plantation trials being discussed.

INTRODUCTION

The Sarawak State Government has targeted to establish one million hectares of planted forest by year 2020. Approximately 30 million seedlings are required annually to achieve this target with *Acacia mangium* as the main species selected (STA Review, 2009). It is vital to improve the developmental growth of plantation species by controlling disease epidemics in ensuring the success of forest plantation. However, intensive forestry plantation based on growing one tree species over large area such as *A. mangium* has contributed to an ecologically imbalance environment that will subsequently lead to epidemics of pathogens or pest that will definitely interfere with the production of healthy, valuable tree crop.

A. mangium is susceptible to diseases such as root rot caused by *Ganoderma philippii*, *G.aff. steyaertanum* and *Phellinus noxious* (Morag Glen, *pers comm*), heart rot pathogen such as *Rigidoporus hypobrunneus* and foliar pathogen such as *Atelocaulis digitata* (Old *et al.*, 2000). The red rot disease associated with *G. philippii* is by far the greatest threat to mature *A. mangium* plantations with a recorded 20% mortality in Indonesia's plantations and mortality is increasing in much younger second- and third- rotation plantations. In Peninsular Malaysia, 40% mortality has been recorded in trees aged between 10-14 years old (Lee, 2009).

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WOOD MACHINING PROPERTIES OF *ACACIA MANGIUM* SUPERBULK PLANTED IN SARAWAK

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ABSTRACT

‘Superbulk’ is the trade-name of a clone derived from selective breeding of *Acacia mangium* in Sarawak. It is now widely planted in the State. This paper describes how specimens of ‘Superbulk’ were assessed for the various machining properties, namely: planing, sanding, boring, mortising, shaping and turning. The results are then compared with that of *Acacia mangium* and other plantation timber species.

INTRODUCTION

The establishment of forest plantations in Malaysia is a key strategy to mitigate the anticipated shortage in wood supplies from the natural forests. The Malaysian Government has set aside RM 1.07 billion (~ USD 330 mil.) soft loans to promote the planting of 375,000 hectares of forest plantations to yield 75 million m³ of logs by year 2020. According to the FAO World Bank Development report, the global demand for wood products is projected to increase from 3.5 billion m³ in 1990 to 6.4 billion m³ in 2020.

Sarawak is embarking on planted forest establishment through smart partnership with the private sector. The State aspires to plant 1.0 million hectares of planted forests by 2020, of which is expected to provide about 10 to 15 million m³ of wood for the timber industry. This is to ensure sustainable supply of raw materials for local processing as well as to mitigate over-dependency on raw materials from natural forests. The Forests (Planted Forest) Rules 1997 was introduced and came into force on 1 March 1997 to regulate the establishment of planted forests. Presently, 45 Licenses Planted Forest (LPF) licenses have been issued for available LPF areas of 2.8 million hectares. To date, there are about 350,000 ha of the land area has been planted. About 70% of the planted areas are planted with *Acacia mangium* and its hybrids species including *Acacia mangium* superbulk.

It is known that *Acacia mangium* is a fast growing species and grows well on depleted soil. *Acacia mangium* superbulk is a genetically improved *Acacia mangium*, with technical aid from CSIRO of Australia, the state Forest Department and other research bodies.

With such improvement and modification, the intention to utilize *Acacia mangium* superbulk as building materials such as furniture, plywood, structural glulam and particleboard as well as pulp and paper is growing. Nevertheless, the information concerning the wood machining properties of the planted *Acacia mangium* superbulk is still lacking.

¹ Sarawak Forestry Corporation

PENGESANAN DAN PEMETAAN JANKITAN PADA DIRIAN ACACIA MANGIUM BERASASKAN CERAPAN HIPERSPEKTRAL DARI UDARA

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ABSTRACT

Serangan penyakit pada dirian ladang hutan seperti Acacia mangium boleh memberi kesan kepada hasil serta kejayaan projek penanaman pokok berkenaan. Kaedah penilaian secara manual yang digunakan pada masa ini memrlukan masa yang panjang di mana kesan penyakit tersebut hanya dapat dinilai berdasarkan kepada anggaran daripada pemerhatian di lapangan. Dengan kemajuan teknologi terkini seperti cerapan hiperspektral, jangkitan pada dirian pokok berkenaan dapat dikesan secara tepat dan menyeluruh. Kajian ini menunjukkan penemuan aplikasi teknologi hiperspektral untuk pengesanan dan pemetaan penyakit pada dirian Acacia mangium yang berusia 2 tahun di lesen ladang hutan Polima Forest Plantation (LPF42) di Sarawak.

1 Sarawak Forest Department

2 Malaysian Timber Industry Board (MTIB)

3 Universiti Malaysia Sarawak (UNIMAS)

CREATIVE FUNDING MECHANISM FOR THE ENHANCEMENT OF SUSTAINABLE FOREST MANAGEMENT WITH SPECIAL REFERENCE TO THE MALUA WILDLIFE HABITAT CONSERVATION BANK

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ABSTRACT

The conservation of Malua Forest Reserve (FR) as a critical wildlife habitat in Sabah may not be able to achieve its ultimate goal, if it does not have any proper plan of self financing in the future. The Sabah Forestry Department cannot financially afford to secure the habitat, merely by declaring and committing the entire forest as a protected area. A foreign partner, New Forests Pty Limited, has offered an innovative approach by the establishment of an ecoproducts bank, which is to create a commercially sustainable model for large scale conservation and rehabilitation in the Malua Forest Reserve. The project concept is to translate forest conservation into a tradeable product so that biodiversity conservation could compete with other land uses on a commercial basis through the selling of Biodiversity Conservation Certificates.

INTRODUCTION

Malua Forest Reserve (FR) is a part of the Ulu Segama-Malua Sustainable Forest Management Project (US-M SFMP). This project was launched on 15th March 2006, as a milestone of political commitment by the State Government of Sabah towards protecting, conserving and rehabilitating a very vital ecosystem which holds the largest concentration of endangered wildlife species, notably orang utans in Sabah. The US-M SFMP covers 241,098 ha of Permanent Forest Reserves (PRFs) and is managed jointly by the Sabah Forestry Department (SFD) and Yayasan Sabah (YS), as the concessionaire.

Legal Status

Malua Forest Reserve comprises of 33,969 ha of production forests and it has been gazetted as a PRF since 1961 and regazetted in 1984. This area is a part of Yayasan Sabah's Concession Area and located in the Kinabatangan District. Under the Sustainable Forest Management (SFM) concept, the area is positioned within the Forest Management Unit (FMU) No. 20.

¹District Forest Officer of Ulu Segama-Malua

²Manager, Forest Management Enterprise

³Senior Officer, Forest Resource Management Division

THE POTENTIAL OF NATIVE PLANTS IN SABAH FOR ORNAMENTAL PURPOSES : EFFORT TOWARDS COMMERCIALISATION AND CONSERVATION

RICHARD J. MAJAPUN¹, EYEN KHOO¹, JOAN T. PEREIRA¹,
VERONICA S. GUANI¹, MARIA AJIK¹, KUINA KIMJUS¹, REBECCA CHONG¹,
ANDI MARYANI MUSTAPENG¹, SUZANA SABRAN¹ AND JOHN B. SUGAU¹

ABSTRACT

Sabah is endowed with rich plant diversity, encompassing some of the rare and endemic plants with great ornamental potential. As such, it is a window of opportunity for breeders and plant enthusiasts to not just discover but also to develop their ornamental potential. Prior to the surveys, potential plant groups that are deemed to be of ornamental and commercial value were identified. Efforts were then taken to design propagation methods for the selected plants, using viable options of conventional propagation and tissue culture techniques in pilot scale production. The end products are envisaged to be channeled into two sub-programs; marketing of ornamental native plants and *ex-situ* conservation of native plants. It is hoped that through this, we will be able to generate revenue for the state through commercialising the native plants with high ornamental values. In addition, the *ex-situ* conservation efforts will be used to create awareness among the plant breeders and public regarding the importance of conserving native plants, especially in preserving genetic diversity for future breeding and plant improvement purposes.

INTRODUCTION

Sabah, located at the northern part of Borneo, is rich in plant diversity, with many unique flora. It is the second largest state in Malaysia with a landmass of approximately 7.37 million hectares and comprising a total of 4.7 million hectares of forested area. Much of these forested areas are gazetted as permanent forest reserves, in an effort to conserve the various types of forests for future generation.

In view that Sabah is located right above the equator, it has a typical equatorial climate, with high humidity, rainy season from November to March and an average temperature ranging from 23 to 32°C. From the various habitats available, as a result of the topography and geography of the State, it has given rise to a rich array of plant species that leads to species endemism. Through the various expeditions and scientific surveys, it was discovered that many of the plants in Sabah have great ornamental potential. Therefore, efforts should be made in Utilising such potentials. Aside from that, through studies it was also found that there is a depletion in certain plant groups as a result of overharvesting by the plant enthusiasts or degradation of plant habitats. In view of this, efforts are needed to design propagation methods for the potential plant groups in concern not just from the aspect of generating revenue through its potential as ornamentals but also for conservation and reintroduction back to its natural habitat.

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TEKNOLOGI *RADIO FREQUENCY IDENTIFICATION* (RFID) DALAM SEKTOR PERHUTANAN

HAMIDI ABD HALIM¹, HARRY YONG² DAN MOHD SHAHRIL ZULKIFLI³

ABSTRAK

Malaysia merupakan sebuah negara hutan tropika yang mengamalkan Pengurusan Hutan Secara Berkekalan atau *Sustainable Forest Management* (SFM) dengan menitik beratkan keseimbangan faktor ekonomi, sosial dan alam sekitar. Selaras dengan hasrat Kerajaan untuk memastikan hutan tetap terpelihara dan diurus secara mampan, RFID dilihat sebagai salah satu inisiatif berteknologi dalam menyokong SFM. Teknologinya dapat menambah baik sistem kerja sediaada dan menjadikan kakitangan bekerja secara lebih efisien. Pengalaman bersama RFID di Semenanjung Malaysia di Negeri Sembilan melibatkan pengeluaran pas pemindah dan aktiviti penguatkuasaan. Pemanfaatan teknologi baru ini memperkemaskan lagi proses pemantauan dan pengawalan hasil negara selain mempertingkatkan perkhidmatan yang diberikan oleh jabatan kepada pelanggan.

PENDAHULUAN

Radio Frequency Identification atau RFID merupakan satu teknologi yang menggunakan gelombang radio dalam pengenalpastian identiti sesuatu objek. Pada tahun 2003, Kerajaan Malaysia telah membuat keputusan strategik untuk memulakan projek *Malaysia Microchip* setelah menyedari *trend* kegunaan dan potensi teknologi ini yang baik di peringkat global. RFID digunakan dalam pelbagai kegunaan mengesan identiti objek dalam sektor pertanian, penternakan, pengangkutan, kesihatan, kewangan dan keselamatan seperti mengesan identiti haiwan, pergerakan aset, pembayaran tol dan maklumat di dalam pasport. Dalam sektor perhutanan pula, ia dilihat memberi manfaat kepada pengesanan pergerakan kayu kayan dalam aktiviti pengusahaan dan penguatkuasaan hutan.

Pada tahun 2008, satu projek ringkas RFID dengan kerjasama Kerajaan Malaysia bersama *International Tropical Timber Organisation* (ITTO) dan CITES telah dicuba untuk memantau pergerakan spesies Ramin di Hutan Simpan Pekan, Pahang. Hasil dari pengalaman dalam projek tersebut, Jabatan Perhutanan Semenanjung Malaysia (JPSM) telah memulakan langkah sendiri membangunkan Sistem RFID Modul Pas Pemindah dan Modul Penguatkuasaan Hutan pada tahun 2010 dan seterusnya diujipakai di lapangan pada tahun 2011 di salah satu kawasan lesen pengusahaan hutan di Negeri Sembilan.

1 Penolong Pengarah Kanan (Pengurusan Hutan Darat), Bahagian Pengurusan Hutan, Ibu Pejabat Perhutanan Semenanjung Malaysia

2 Penolong Pengarah Penilaian Sumber Hutan Kayu, Bahagian Pengurusan Hutan, Ibu Pejabat Perhutanan Semenanjung Malaysia

3 Penolong Pegawai (Sistem Pengurusan Hutan Darat I), Bahagian Pengurusan Hutan, Ibu Pejabat Perhutanan Semenanjung Malaysia

COMPETENCY ASSESSMENTS ON GRADE PROMOTION POLICY WITH SPECIAL REFERENCE TO FIELD STAFF OF FORESTRY DEPARTMENT PENINSULAR MALAYSIA

MOHD RIDZUWAN ENDOT¹, MUHAMAD AZMI IBRAHIM² AND
IBRAHIM ISMAIL³

ABSTRACT

Examination is one of competency assessment tools used in public service either for confirmation from temporary post to permanent post or for continuous evaluating competency as part of requirements under career development. In this regard, Forestry Department Peninsular Malaysia (FDPM) has continuously improved the training in its effort towards enhancement of skills and knowledge of the foresters since its inception in 1901. However, the aim of training forester only was realized 25 years later with the establishment of the Forestry Training School in Kepong by FDPM in 1926. Since then, various developments and changes have taken place due to the changes in departmental policy on human resource management. One of the great visible changes is the policy on the promotion of a lower grade worker to higher grade worker in the service scheme (Kenaikan Pangkat Secara Langsung: KPSL), such as from Special Labour Force (Pekerja Rendah Awam Khas: PRAK) to Forester (Pengawas Hutan) and from Forester to Forest Ranger (Renjer Hutan). Current policy denotes that candidate shall possess a certificate known as Sijil Perhutanan Pengawas Hutan or Sijil Perhutanan Renjer Hutan. This policy requires candidate to pursue a one or two years training course to be awarded Sijil Perhutanan Pengawas Hutan or Sijil Perhutanan Renjer Hutan, respectively. Another option is that candidate may sit for special examination conducted by FDPM twice a year, and if the required passing mark is met, he/she is eligible to apply and considered for promotion. Nevertheless, appointments of forester and forest ranger that are promoted from the two options have shown dissimilarities in terms of work skills, knowledge, performance and quality. Therefore, this paper is intended to enlighten on the competency assessment by analyzing the frequency of candidate took the examination, age factor and the grade (mark) attained by candidate based on 3 years data bank. Furthermore, it also examined issues, challenges and proposed future directions in implementing competency assessment undertaken by Competency Section, Service Management Division of Forestry Department Peninsular Malaysia. At the end, this paper will provide suggestion upon which future competency assessment on grade promotion to forester and forest ranger will be based upon.

INTRODUCTION

Forest is one of the importance components biophysical system in our ecosystem. Besides providing timber and other forest produces, forests also play a strategic role in ensuring good environment quality for water resources protection, controlling of nutrient loss and soil erosion, temperature control and conservation of forest biodiversity for economic use. Thus, forest resources should be managed, governs, conserve and develop professionally, systematically and effectively for the multiple use of goods and services sustainably.

1 Head of Competency Section, Forestry Department Peninsular Malaysia

2 Deputy Director, Forest Management Division, Forestry Department Peninsular Malaysia

3 Director, Service Management Division, Forestry Department Peninsular Malaysia

5.6 Plenary Session 6

FOREST LAWS AND ENFORMENT
(Penguatkuasaan Dan Perundangan Hutan)

LEGALITY VERIFICATION OF LOGS IN SARAWAK

JACK LIAM¹, WONG TING CHUNG², SEMILAN RIPOT², MOHIDIN ZAILANI HJ KRAM³,
ISHAK BOHARI ⁴ AND ANNIE TING⁵

ABSTRACT

In recent years, there has been demand to prove that timbers traded in the global market are coming from legal sources. Both the State Government and industry are working together to ensure that logs from Sarawak are legal. This paper articulates how Sarawak verify the legality of logs from the timber licence areas to the various designated point(s) based on existing governing laws, regulations and procedures.

INTRODUCTION

Forestry has contributed significantly to the economy and development of the State of Sarawak. The timber industry remains a major contributor to the State's revenue after oil and gas. The annual collection of timber royalties for 2010 is approximately 14% of the estimated revenue of Sarawak of RM5.20 billion.

The Malaysian Federal Constitution Article 72(2) stipulates that land and natural resources are under the legislative authorities of the State. Hence, forestry and forests come under the State List which gives each State Government full jurisdiction over its respective forest resources, authority to formulate its own forest policies, and enact forestry laws including rights to forest revenues. The Federal Government provides technical advice on forest management and development; undertakes research and education; and promotes industrial development of wood-based industries and trade.

Forestry in Sarawak falls under the purview of the Ministry of Resource Planning & Environment. It oversees and coordinates the functions of four main agencies related to forestry namely Forests Department Sarawak (FDS); Sarawak Forestry Corporation Sdn. Bhd. (SFCSB); Sarawak Timber Industry Development Corporation (STIDC) and Harwood Timber Sdn. Bhd. (HTSB). These four agencies had worked together to develop and implement the Inter-agency Standard Operating Procedures (SOPs) for Performance of Forestry Functions in Sarawak that covered a range of forestry operations including compliance with harvesting (licence) conditions, revenue collection and control of movement of logs. The SOPs established clarity of roles and responsibilities of each agencies, standardized, streamlined and improved work flow as well as enhanced operational cost-effectiveness.

In Sarawak, legal logs are defined as logs harvested by licensed persons from approved areas and verified by the relevant authorities in accordance with the laws, regulations and procedures pertaining to forestry and trade in Sarawak.

1 Forest Department Sarawak

2 Sarawak Forestry Corporation

3 Sarawak Timber Industry Development Corporation

4 Harwood Timber Sdn. Bhd.

5 Sarawak Timber Association

TLAS – SFMLA AUDITING IN SABAH: A STEP FORWARD FOR LEGAL FRAMEWORK AND MONITORING SYSTEM OF SFM IMPLEMENTATION IN SABAH

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MOHD SALLEH ABBAS² AND SITI ZUBAIDAH ABDULLAH³

ABSTRACT

In 2009, the Sabah Forestry Department (SFD) in collaboration with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, under the German-Netherlands Support Programme has developed standard audit guidelines, which are within the framework of the TLAS requirements under the FLEGT VPA process in Malaysia. These audit guidelines were then field-tested by an independent third party auditor - Global Forestry Services (Malaysia) Sdn Bhd for four (4) rounds in 16 SFMLA/LTL areas and two (2) rounds in another 8 SFMLA/LTL areas. The scope of the audit covered all aspects of forest operations in the SFMLA/LTL areas as they relate to laws and regulations and legality requirements against the stipulation of the Sustainable Forest Management License Agreement (SFMLA), Forest Management Plan, Annual Work Plan and TLAS. This paper discusses the development and results from the field-tested audit exercises. The results suggested that the developed audit guidelines are applicable for effective control mechanism of SFM implementation in the SFMLA/LTL managed areas against legal requirements, as well as, a tool to verify timber legality. The paper also highlights the “key points” of the auditing exercises and concludes with some recommendations for future comprehensive auditing systems for SFM implementation in Sabah.

BACKGROUND

The central requirement for the Forest Law Enforcement Governance and Trade - Voluntary Partnership Agreement (FLEGT - VPA) process is to ensure compliance with the legal framework for forest management, harvesting, ecological and social conditions within the Forest Management Units (FMU). It is also a necessity that there is an independent system in place to ensure that the forest operators or FMU holders are complying with the nationally defined legality standards. Malaysia is in the process of developing a comprehensive Timber Legality Assurance System (TLAS) and has put forward key procedures to the European Union (EU) during the 4th Technical Working Group Meeting on a FLEGT – VPA in 2008. The TLAS has 4 main elements. They are:

- i. Definition of Legal Timber;
- ii. Principles and Criteria of Legal Timber;
- iii. Details of Control Procedures for TLAS; and
- iv. Principles of Independent Monitoring.

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A NEW DIMENSION ON FORESTRY LEGISLATION TOWARDS SYNERGISTIC APPROACH IN STRENGTHENING ENFORCEMENT ACTIVITIES: ISSUES AND CHALLENGES

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ABSTRACT

Malaysia is fully committed to manage its natural forest in a sustainable manner. In this endeavour, the Forestry Department is fully committed to ensure continuous timber production while maintaining multiple functions of the forests for biodiversity conservation as well as minimizing environmental impact. The sustainable forest management practices in Peninsular Malaysia has been recognised and proven to be one of the tools in sustaining the forest resources and fulfilling the balanced need between social, economy and the environment. However, due to the present development, challenges and the demand by both local and international communities, issues on forest offences especially illegal logging and forest encroachment is recognised as a serious threat to the sustainability and successful management of forest resources worldwide. In addition, the concept of good governance should be incorporated in the legislation administration and management of the public sector. Some important elements in good governance include transparency, accountability, community participation, capacity building and integrated coordination of enforcement activities among agencies. Thus, it is timely and an important strategy to review the present existing forestry law and legislation with a new dimension in strengthening the effectiveness of enforcement activities. In facing this situation, five (5) elements have been identified as a factor namely broaden the power of enforcement, increasing forest offences penalty for a deterrent punishment, developing a quality investigation and strong evidence gathering; updating a comprehensive enforcement procedure; and interrelated coordination among the laws. Therefore, this paper highlight the efforts undertaken by the Forestry Department of Peninsular Malaysia (FDPM) in combating illegal logging and forest related crimes to ensure the sustainability functions of forest for social prosperity, economic and environmental purposes. It also discusses several key issues and challenges in relation to the functions of a new dimension of legislation in implementing integrated enforcement activities through synergistic approach in Peninsular Malaysia.

INTRODUCTION

Forest is a renewable natural resource which plays a very important role in socio-economic development of the country. It provides timber for the construction of housing and other buildings, water for domestic and industrial consumption and food for local communities. In addition, forests is the home to many species of flora and fauna which hold great potential for future sources of important commodities including food and medicine. Forests also offer numerous intangible services in the forms of recreation, environmental protection, weather stabilization and ecotourism. These services are not only enjoyed by the local communities but also by those from other countries. A particular service in point is that of carbon sequestration. This important resource, therefore, need to be manage base on a sustainable principle so that its benefits can be utilised perpetually by future generations.

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CABARAN DAN KEPERLUAN ASAS DALAM MELENGKAPKAN PENYIASATAN KESALAHAN HUTAN SEKSYEN 15 AKTA PERHUTANAN NEGARA, 1984

MOHAMED ALI HJ. HAWARI¹, ABDUL WAHAB DERAMAN¹,
MOHD. RIZAL SABRAN¹, MOHD. RUBAAI SARPIN¹, ASMADI MOHD.¹,
ZAHARI IBRAHIM¹ DAN MOHD SYAHRIR SALLEH¹

ABSTRAK

Usaha-usaha untuk membanteras kegiatan pembalakan haram di negara ini telah menjadi satu agenda penting Kerajaan dalam memastikan khazanah hutan terpelihara dan terjamin keberkekalannya untuk kepentingan ekonomi, sosial dan alam sekitar. Pembalakan haram adalah satu kesalahan di bawah Seksyen 15 Akta Perhutanan Negara (APN) 1984. Disebabkan keseriusan kesalahan ini, Persidangan Majlis Perhutanan Negara (MPN) ke-18 telah membuat ketetapan supaya kesemua kes di bawah Seksyen 15 APN 1984 diselesaikan dan dihukum melalui perbicaraan di Mahkamah. Oleh itu penyiasatan semua kes pembalakan haram di bawah Seksyen 15 APN 1984 perlu dijalankan dengan rapi dan kertas siasatan yang lengkap dan kemas dengan bukti dan fakta kes yang kukuh perlu disediakan sebelum pendakwaan dibuat di Mahkamah. Pegawai-pegawai Hutan yang menjalankan tugas sebagai Pegawai Penyiasat di lapangan mengakui terdapat kesukaran untuk membuktikan perbuatan 'mengambil' di bawah Seksyen 15 APN 1984 dalam menyempurnakan penyiasatan sesuatu kes. Analisis SWOT bagi mengenal pasti kekuatan, kelemahan, peluang dan ancaman yang terdapat serta merangka strategi dalam menyelesaikan siasatan perlu dijalankan untuk memperkukuhkan pembuktian kes. Beberapa amalan dan prosedur sedia ada perlu penelitian dan penambahbaikan dalam usaha menjayakan penyiasatan dan pensabitan kes di bawah Seksyen 15 APN 1984 ini. Bagi tujuan tersebut, kertas ini akan berkongsi pengalaman tentang isu dan cabaran yang dihadapi oleh Pegawai Penyiasat Jabatan-jabatan Perhutanan Negeri di Semenanjung Malaysia dalam mengendalikan siasatan kes pembalakan haram. Kertas ini juga menggariskan beberapa langkah dan cadangan penambahbaikan ke atas amalan, mekanisme, prosedur, kelengkapan, peralatan dan infrastruktur dalam memastikan keberkesanan dan peningkatan kualiti kerja siasatan terutamanya bagi kes kesalahan di bawah Seksyen 15 APN 1984 untuk memudahkan pembuktian kes di mahkamah.

PENGENALAN

Jabatan Perhutanan Semenanjung Malaysia (JPSM) telah membuat ketetapan bahawa kertas siasatan perlu disediakan bagi semua kes kesalahan hutan. Memandangkan kes kesalahan hutan di bawah Seksyen 15 APN 1984 melibatkan hukuman denda yang tinggi dan hukuman penjara mandatori maka penyediaan kertas siasatan hendaklah terperinci, kukuh dan lengkap untuk pembuktian kes di Mahkamah.

¹ Jabatan Perhutanan Semenanjung Malaysia



6.0

RESOLUTIONS OF THE 16TH
MALAYSIAN FORESTRY
CONFERENCE

Pongo Pygmaeus

6.0 RESOLUTIONS OF THE 16TH MALAYSIAN FORESTRY CONFERENCE

The 16th Malaysian Forestry Conference was held on 5-9 December 2011 in Malacca with the theme “Forests for Community Livelihood”. The Conference was officiated by the Right Honourable Chief Minister of Malacca and attended by a total of 281 participants and observers.

The Conference was conducted in six (6) Plenary Sessions, namely:

- Session 1: Sustainable Forest Management and Forest Certification
- Session 2: Forest Economics and Ecotourism
- Session 3: Forest and Climate Change
- Session 4: Forest Biodiversity and Conservation
- Session 5: Innovations and R&D in Forestry
- Session 6: Forest Laws and Enforcement

A total of 36 working papers and 18 posters were presented during the Conference. Based on the discussions held and issues raised, the Conference adopted the following:

1. Recognising that forest management certification is a meaningful yardstick for effective implementation of sustainable forest management, the Conference resolved that:-
 - 1.1 All Forest Management Units be encouraged to fully undertake forest management certification under Malaysian Timber Certification Scheme (MTCS) or other credible internationally recognised scheme;
 - 1.2 Frequent consultation amongst the forestry agencies in Sabah, Sarawak and Peninsular Malaysia be undertaken to facilitate the sharing of experiences gained in implementing forest management certification;
 - 1.3 Adequate funding and technical support be made available to various components that contribute towards effective implementation of sustainable forest management;
 - 1.4 Wider participation of, and consultation with relevant stakeholders in forest management and conservation be further encouraged;
 - 1.5 Community forestry in improving livelihood be accorded greater emphasis in sustainable forest management; and
 - 1.6 Leadership at the highest level be constantly updated on the importance and the state of implementation of forest management certification to enhance their continued commitment and support.

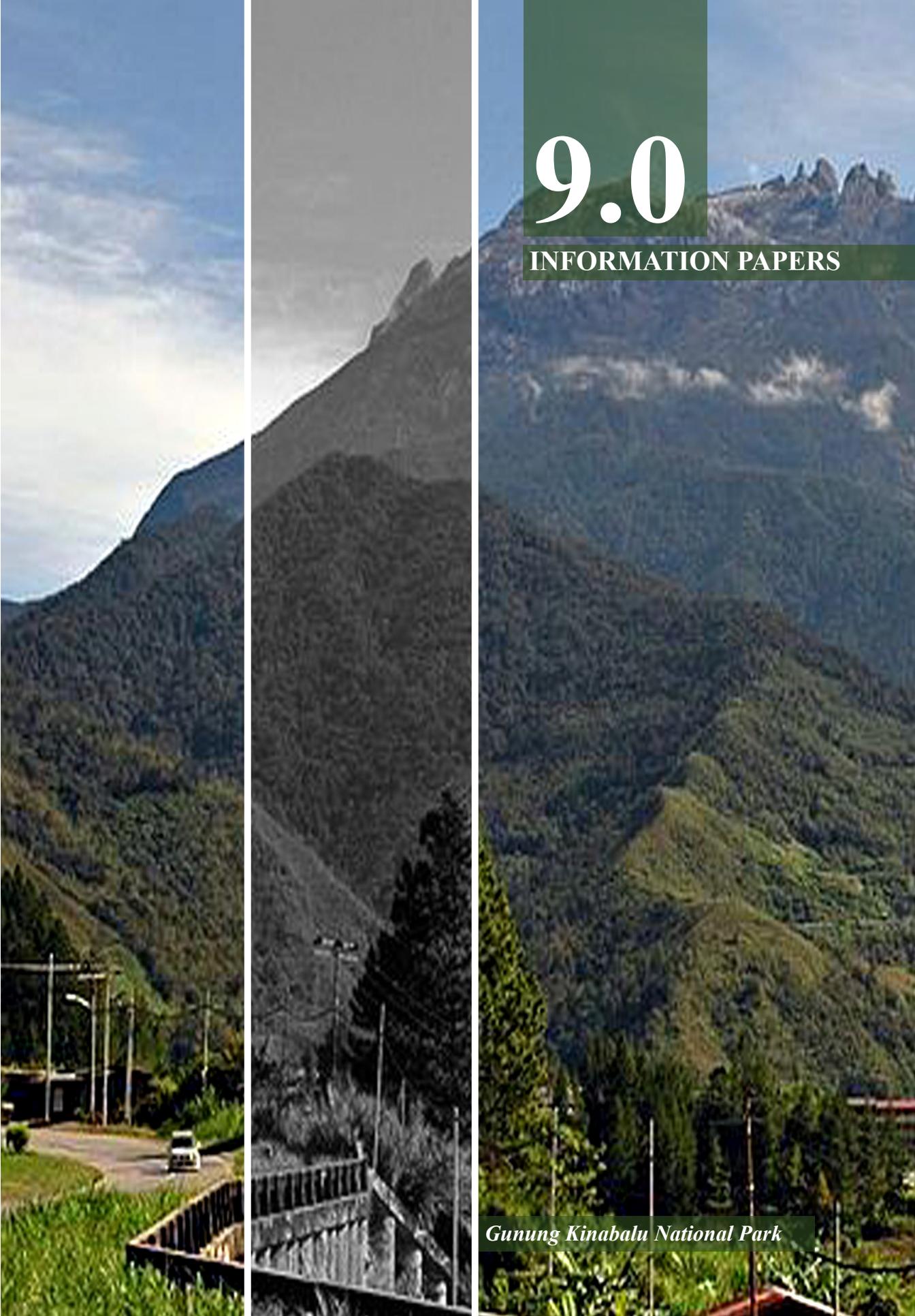
2. Recognising the increasing demand on forest for recreation and ecotourism activities, the Conference resolved that:
 - 2.1 Consolidated efforts be intensified to enhance capacity building, promotions and marketing of forest recreation and ecotourism areas;
 - 2.2 Economic opportunities be further developed for revenue generation and employment;
 - 2.3 Greater participation of local community be encouraged; and
 - 2.4 Potential ecotourism areas be explored and further developed.

3. Recognising the important roles of forest in mitigating the adverse effects of climate change, the Conference resolved that:
 - 3.1 Concepts, policies, initiatives and research activities related to climate change and the roles of forests be revisited, explored and/or intensified;
 - 3.2 Road map at national and sub-national level for REDD+ and/or other climate change mitigation and adaptation measures be formulated and implemented; and
 - 3.3 Adequate funding and technical support be made available to mitigate adverse effect of climate change including the use of renewable energy.

4. Recognising the significance of forest biodiversity and conservation, the Conference resolved that:
 - 4.1 Actions be taken to further document forest biodiversity and enhance the protection of areas with high conservation values;
 - 4.2 Efforts be intensified to harness forest biological resources for sustainable economic purposes;
 - 4.3 Formulation of mechanism for Access and Benefit Sharing (ABS) of biological resources, notably for the local and indigenous communities, be fully supported;
 - 4.4 Ex-situ conservation of rare, endangered and threatened species in suitable locations be accorded greater emphasis; and
 - 4.5 Conservation Education and Public Awareness (CEPA) initiatives be further enhanced to promote forest biodiversity and conservation.

5. Recognising that R&D and innovations are crucial towards realising sustainable forest management, the Conference resolved that:
 - 5.1 State-of-the-art technologies and innovative approaches be further explored and utilised as tools to enhance forest management and conservation as well as forest industry;
 - 5.2 The utilisation of the rich biological diversity be further optimised for the development of herbal, ornamental, cosmetic and pharmaceutical products through the application of appropriate biotechnology;
 - 5.3 Capacity building to enhance professionalism and expertise be further intensified; and
 - 5.4 Cooperation and collaboration among researchers, forest managers, practitioners and other stakeholders be enhanced and synergised.

6. Recognising the importance of fostering greater integrity, professionalism and dedication of forestry personnel, as well as in enhancing forest law enforcement towards sustainable forest management, the Conference resolved that:
 - 6.1 The existing forestry legislations be kept up-to-date and relevant in line with the changing forestry environment and societal needs;
 - 6.2 Capacity building for forestry personnel in preparing investigation papers and tendering of evidences for forestry offences be enhanced;
 - 6.3 Information exchange on law enforcement be enhanced amongst the forestry agencies in Sabah, Sarawak and Peninsular Malaysia; and
 - 6.4 Innovative technologies and integrated approaches be employed to enhance the effectiveness of forest law enforcement.



9.0

INFORMATION PAPERS

Gunung Kinabalu National Park

KAJIAN EKONOMI REKREASI MEMANCIK IKAN DI KOLAM PANCING

AZRUL EKHUAN ELIAH¹, MOHD SHAHWAHID HJ. OTHMAN²
DAN POH LYE YONG¹

ABSTRAK

Kajian ini dijalankan bagi mengukur kepentingan sumber ekonomi ikan di kolam pancing dalam suatu hubungan pengeluaran barangan dan perkhidmatan melalui penentuan nilai ekonomi ikan-ikan yang di perolehi dari perusahaan kolam pancing sebagai salah satu daripada sektor eko-pelancongan di negeri Pahang. Kaedah *Contingent Valuation Method* (CVM) digunakan untuk mendapatkan nilai ekonomi memancing ikan di kolam pancing dalam konteks eko-pelancongan di negeri Pahang. Borang soal selidik dibentuk untuk menemubual pemancing-pemancing ikan bagi mendapatkan maklumat berkaitan dengan sosio ekonomi pemancing ikan, harga bayaran masuk ke kolam, harga pasaran ikan di kolam, kos memancing dan perjalanan, jenis dan spesis ikan dan kesanggupan membayar (*Willingness to Pay - WTP*). Seramai 53 responden daripada kolam-kolam pancing yang terletak di sekitar daerah Raub, Kuala Lipis, Kuantan, Pekan, Maran dan Jerantut di negeri Pahang telah ditemubual.

Keputusan kajian menunjukkan bahawa yuran sekali masuk untuk tiga (3) jam adalah di antara RM 12.00 - RM 100.00 dengan purata WTP sebanyak RM 32.94. Manakala bayaran sebenar sekali masuk untuk tempoh yang sama adalah di antara RM 10.00 - RM 36.00, dengan puratanya RM 18.00. Dari segi fungsi regresi, didapati pembolehubah-pembolehubah seperti bilangan lawatan bulanan dan yuran masuk beranjalan positif kepada WTP, manakala umur beranjalan negatif. Di kolam pancing, hanya ikan yang beratnya lebih dari 3 kg sahaja dibenarkan untuk dibawa pulang. Sementara ikan yang beratnya kurang daripada 3 kg akan dijual kembali kepada pengusaha kolam dengan harga pasaran. Harga pasaran ikan adalah di antara RM 1.00 - RM 21.00/kg bergantung kepada jenis dan spesis. Ikan yang berharga RM 1.00/kg adalah jenis Pacu dan Likur, manakala harga RM 21.00/kg pula adalah dari jenis Tongsan. Harga ikan di setiap kolam adalah berbeza bergantung kepada pemilik kolam tersebut. Perkembangan aktiviti kolam memancing ini dan kewujudan kesanggupan membayar pemancing ikan tawar ini berpotensi dalam meningkatkan pemuliharaan biodiversiti hutan serta sungai-sungai di dalamnya. Ini dapat mengurangkan tekanan kepupusan sumber ikan air tawar di sungai-sungai dalam hutan bagi memberi peluang untuk sumber ikan air tawar ini membiak. Ini boleh meningkatkan nilai barangan dan perkhidmatan sumber hutan di Semenanjung Malaysia.

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CADANGAN PENYERAGAMAN KURSUS SIJIL PERHUTANAN PENGAWAS HUTAN DAN SIJIL PERHUTANAN RENJER HUTAN BAGI MALAYSIA

AZMI BIN NORDIN¹

ABSTRAK

Sekolah Perhutanan Kepong (SPK) telah ditubuhkan dalam tahun 1927 yang pada masa itu dikenali sebagai Sekolah Perhutanan Negeri-Negeri Melayu Bersekutu (Federated Malay States School of Forestry). SPK adalah institusi latihan perhutanan tertua di Malaysia dan berfungsi sebagai satu seksyen di bawah Bahagian Latihan Perhutanan, Jabatan Perhutanan Semenanjung Malaysia (JPSM). Pada peringkat awal penubuhannya, penekanan silibus pembelajaran ditumpukan kepada enam (6) bidang utama meliputi Ukuran Tanah dan Kejuruteraan Hutan, Pengenaln Kayu, Asas Botani, Undang-Undang, Mensurasi Hutan dan Asas Silvikultur & Pengurusan Hutan. Sejak penubuhannya pelatih-pelatih yang datang bukan sahaja dari Semenanjung Malaysia malah dari Sabah, Sarawak dan Brunei Darussalam. SPK telah dijenamakan semula sebagai Institut Latihan Perhutanan (FORTRAIN). Dua (2) sijil dikeluarkan oleh FORTRAIN iaitu Sijil Perhutanan Renjer Hutan (SPRH) dan Sijil Perhutanan Pengawas Hutan (SPPH). Tujuan kertas kerja ini adalah bagi berkongsi pendapat mengenai cadangan penyeragaman silibus tahun pertama Kursus SPRH dan Kursus SPPH serta syor pengecualian tahun pertama Kursus SPRH bagi calon yang memperolehi keputusan cemerlang dalam Kursus SPPH dan memenuhi syarat-syarat kemasukan yang ditetapkan. Cadangan dan syor ini diharap dapat menambah baik pelaksanaan Kursus SPRH dan Kursus SPPH serta menyeragamkan penetapan gaji permulaan bagi pelantikan Pengawas Hutan dan Renjer Hutan yang mempunyai kelayakan SPPH dan SPRH daripada SPK dan Institut Perhutanan Sabah (IPS).

TUJUAN

Kertas kerja ini bertujuan memaklumkan cadangan penambahbaikan dan penyeragaman pelaksanaan Kursus SPRH dan kursus SPPH di institut-institut latihan perhutanan di Malaysia iaitu:

- i) cadangan penyeragaman silibus Kursus SPRH dan Kursus SPPH selaras dengan perkembangan terkini dalam sektor perhutanan;
- ii) cadangan pengecualian pengajian tahun pertama Kursus SPRH untuk pemegang SPPH;

¹Former Director of Forestry Training, Forestry Department Peninsular Malaysia

HALATUJU PEMBANGUNAN MODAL INSAN JABATAN PERHUTANAN SEMENANJUNG MALAYSIA (JPSM)

ZAINAL JAIN¹ DAN DURRUTUL AIN¹

ABSTRAK

Jabatan Perhutanan Semenanjung Malaysia (JPSM) yang ditubuhkan sejak tahun 1901 merupakan agensi teknikal berperanan untuk mentadbir, memelihara, mengurus dan membangunkan sumber hutan negara. Tempoh yang telah menjangkau lebih satu abad telah mematangkan Jabatan dalam usaha mengurus khazanah hutan negara secara berkekalan. Justeru itu, pengurusan hutan memerlukan kebijaksanaan bagi mengimbangi permintaan masyarakat terhadap pelbagai keluaran dan perkhidmatan hutan yang sentiasa berubah mengikut peredaran masa. Dalam konteks ini, Jabatan memerlukan satu perancangan yang rapi, teratur serta disokong dengan sumber manusia terlatih yang mempunyai tahap kompetensi tinggi bagi mencapai matlamat tersebut.

Menyedari hakikat ini, adalah perlu digubal halatuju pembangunan insan yang komprehensif menggariskan falsafah, objektif dan strategi untuk melahirkan kakitangan terlatih yang bertanggungjawab, memiliki nilai-nilai murni serta berintegriti tinggi.

DEFINISI LATIHAN

Berdasarkan Pekeliling Perkhidmatan Awam Bil. 6/2005, latihan ditakrifkan sebagai proses pemindahan ilmu pengetahuan secara kemas dan berdisiplin, bertujuan menambah pengetahuan dan kemahiran untuk memenuhi keperluan dan tuntutan semasa dalam organisasi. Ia dicapai melalui sebarang bentuk pembelajaran seperti kursus, latihan semasa bekerja dan program *mentoring/coaching* yang seumpama dengannya yang menyumbang kepada pembangunan individu dan kecemerlangan organisasi.

Manakala menurut Bussiness Dictionary Latihan ditakrifkan sebagai “*Organised activity aimed at imparting information and/or instructions to improve the recipients performance or to help him or her to attain a required level of knowledge or skill*”

¹ Bahagian Latihan Perhutanan, Jabatan Perhutanan Semenanjung Malaysia

PROGRAM PENANAMAN POKOK BAKAU DAN SPESIS-SPESIS YANG SESUAI DI PESISIRAN PANTAI NEGARA : PENILAIAN DARI PERSPEKTIF PEMULIHARAAN DAN PEMELIHARAAN HUTAN

DATO' PROF. DR. HJ. ABD. RAHMAN BIN HJ. ABD. RAHIM¹,
KAMARUZAMAN BIN ALI BUDIN² DAN SUHAILI BIN HJ. ROSLI³

ABSTRAK

Program Penanaman Pokok Bakau Dan Spesis-Spesis Yang Sesuai Di Pesisiran Pantai Negara telah berjaya dilaksanakan mengikut perancangan yang ditetapkan di bawah Rancangan Malaysia Kesembilan (RMKe-9: 2006-2010). Projek pemuliharaan dan pemeliharaan hutan pesisiran pantai negara ini pada dasarnya telah dilaksanakan melalui pendekatan bersepadu yang melibatkan pelbagai agensi kerajaan, institusi penyelidikan, institusi pengajian tinggi, badan-badan bukan kerajaan dan masyarakat tempatan. Program yang berlandaskan kepentingan perlindungan dan pemeliharaan ekosistem ini bertujuan bagi mencapai objektif yang ditetapkan iaitu, untuk memulihara dan memelihara pesisiran pantai negara, mewujudkan zon penanaman yang kukuh, pemulihan habitat pesisiran pantai serta meningkatkan kualiti alam sekitar. Dari tahun ke setahun perkembangan dan kemajuan pelaksanaan program ini terus dipertingkatkan dan ditambah baik melalui kejituan perancangan dan pelaksanaan yang teratur, pengalaman lapangan, panduan penanaman, kepakaran teknikal, perkongsian pintar (*smart partnership*) dan penemuan hasil penyelidikan(R&D). Sejak program ini dilaksanakan dari tahun 2005 hingga 2010, seluas 2,257.67 hektar kawasan pesisiran pantai negara telah ditanam dengan sejumlah 5.86 juta pokok bakau dan spesies-spesies yang sesuai. Pada amnya, projek ini telah berjaya melepasi sasaran 2,010 hektar yang ditetapkan dalam RMKe-9. Kertas ini membincangkan secara ringkas penilaian terhadap pencapaian pelaksanaan program dari perspektif pemuliharaan dan pemeliharaan pesisiran pantai Negara sepanjang pelaksanaannya dalam RMKe-9.

LATAR BELAKANG

Malaysia mempunyai pesisiran pantai yang agak panjang iaitu sejauh 4,800 kilometer. Secara teknikal, pesisiran pantai adalah dikategorikan sebagai satu kawasan pesisiran yang meliputi kawasan bersempadan 5 kilometer ke sebelah darat (*back shore*) dan 16.1 kilometer nautika ke sebelah laut dari paras air pasang perbani (*shore front*). Kawasan di sebelah darat termasuk sungai dan rizab air hingga ke kawasan yang dipengaruhi oleh air masin. Pada amnya, kawasan pesisiran pantai terdiri daripada kawasan pantai landai dan berpasir, kawasan berlumpur seperti hutan paya laut, kawasan muara sungai dan sungai yang di pengaruhi oleh air masin serta pulau-pulau.

¹ Ketua Pengarah Perhutanan Semenanjung Malaysia

²Ketua Penolong Pengarah Ladang Hutan dan Perlindungan Hutan, Ibu Pejabat Perhutanan Semenanjung Malaysia

³Ketua Seksyen Pemuliharaan Pesisiran Pantai, Bahagian Ladang Hutan dan Perlindungan Hutan, Ibu Pejabat Perhutanan Semenanjung Malaysia

PENYELESAIAN DALAM MELENGKAPKAN SIASATAN KES KESALAHAN HUTAN : ISU DAN PENAMBAHBAIKAN

KHAIRIL SARIP¹, AZUAN MOHD SUKRI², MOHD FIRDAUS JAMEL³,
MOHD HAFIZ SAMSUDIN⁴ DAN MOHD KHAIRUL ABDULLAH⁵

ABSTRAK

Penyiasatan kes kesalahan hutan adalah merupakan satu elemen yang penting dalam aktiviti penguatkuasaan hutan bagi memastikan hasrat dan kehendak Kerajaan ke arah pembalakan haram sifar menjelang tahun 2016. Pembukaan kertas siasatan bagi membawa orang yang dituduh (OKT) ke muka pengadilan adalah langkah sewajarnya dalam usaha Kerajaan Malaysia khususnya Jabatan Perhutanan Semenanjung Malaysia (JPSM) menjaga hutan dan memelihara alam sekitar. Dalam usaha memperkemaskan penyiasatan kes-kes kesalahan hutan terutamanya kes pembalakan haram, terdapat berbagai isu dan permasalahan yang dihadapi dalam melengkapkan kertas siasatan kesalahan hutan. Diantaranya isu dan permasalahan tersebut adalah seperti laporan polis tidak merangkumi yang sepatutnya, laporan awal Pejabat Hutan Daerah kurang lengkap dan lambat sampai ke Unit Siasatan, Jabatan Perhutanan Negeri, kesukaran menerima maklumbalas daripada agensi/jabatan lain atau kakitangan jabatan perhutanan sendiri serta kesukaran dalam menubuhkan Unit Siasatan di peringkat negeri. Bagi memastikan penyelesaian untuk melengkapkan kertas siasatan dapat diatasi, beberapa cadangan penambahbaikan telah dikenalpasti iaitu menyelaraskan format laporan polis/awal di peringkat pejabat hutan daerah dan renj., pendedahan dan latihan yang berterusan, tindakan dan bantuan segera daripada Timbalan Pendakwa Raya (TPR) bagi semua kes dan kes melibatkan penahanan warga asing untuk pertuduhan di mahkamah, jalinan kerjasama yang erat dan berterusan dengan agensi penguatkuasaan lain bagi melancarkan penyediaan kertas siasatan dalam tempoh yang singkat, dan akhirnya penubuhan unit siasatan di pejabat hutan daerah bagi membantu pegawai penyiasat dalam menyiapkan kertas siasatan. Kerjasama dan komitmen yang berterusan daripada kakitangan Jabatan Perhutanan dan agensi lain dapat membantu melicinkan penyediaan kertas siasatan seterusnya membawa yang yang bersalah ke muka pengadilan.

PENDAHULUAN

Unit Penguatkuasaan Hutan telah diwujudkan pada 1 Mac 1999. Objektif asal unit ini adalah dalam aspek-aspek penyiasatan, penguatkuasaan dan perundangan dalam kerja-kerja operasi khususnya dalam pengawalan pengusahasilan hutan. Pada 1 Februari 2009, Unit Penguatkuasaan Hutan telah dinaiktaraf kepada Bahagian Penguatkuasaan Hutan.

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OPERASI BERSEPADU PENGUATKUASAAN JABATAN PERHUTANAN NEGERI SELANGOR TERHADAP MASALAH PENCEROBOHAN DALAM HUTAN SIMPAN KEKAL

BORHANUDIN HJ ARSHAD¹ DAN MOHD YUSSAINY MD YUSOP²

ABSTRAK

Jabatan Perhutanan Negeri Selangor telah meletakkan Operasi Bersepadu Membanteras Penerokaan Hutan/ Pendudukan tanpa kebenaran di dalam Hutan Simpan di Negeri Selangor sebagai keutamaan aktiviti jabatan pada tahun 2009. Jabatan Perhutanan Negeri Selangor telah membentangkan Taklimat Pengurusan Hutan dan Penerokaan/ Pendudukan Tanpa Kebenaran Hutan Simpan Negeri Selangor pada 17 November 2008 kepada Majlis Mesyuarat Kerajaan Negeri. Berikutan perbentangan itu, Operasi Bersepadu Membanteras Penerokaan Hutan /Pendudukan tanpa kebenaran di Hutan Simpan Raja Musa telah berjaya dilaksanakan di Hutan Simpan Raja Musa pada 4 Disember 2008, Operasi Bersepadu Membanteras Penerokaan Hutan /Pendudukan tanpa kebenaran di Hutan Kuala Langat Selatan pada 25 Oktober 2010 dan Operasi Bersepadu Membanteras Penerokaan Hutan /Pendudukan tanpa kebenaran di Hutan Simpan Bukit Tarek (Kampung Sungai Kerandang) pada 10 Mei 2011. Operasi yang telah dilaksanakan melibatkan kerjasama pelbagai agensi dan mendapat liputan luas media massa bagi menyampaikan mesej jelas kepada masyarakat mengenai kesalahan hutan dan tindakan penguatkuasaan yang dilaksanakan oleh Jabatan Perhutanan Negeri Selangor. Penglibatan pelbagai agensi penguatkuasaan yang membantu Jabatan Perhutanan Negeri Selangor melaksanakan operasi bersepadu melibatkan jumlah anggota seramai 250-300 orang setiap operasi telah berjaya menyelesaikan masalah penerokaan hutan secara haram/pendudukan secara haram dari pelbagai sudut. Setiap Operasi yang dilaksanakan terlebih dahulu adalah dengan kelulusan Majlis Mesyuarat Kerajaan Negeri melalui Kertas EXCO-MTES bagi memastikan tindakan yang dilaksanakan tidak membelakangkan Pihak Berkuasa Negeri.

PENDAHULUAN

Lebih kurang 15% dari keluasan negara telah ditetapkan sebagai kawasan perlindungan hutan. Selangor telah menetapkan kira-kira 22% daripada keluasan negeri sebagai kawasan perlindungan hutan. *Convention on Biological Diversity* (CBD) telah menetapkan 10% dari ekosistem dunia dilindungi sepenuhnya dan Malaysia adalah parti kepada konvensyen ini. Statistik dalam perenggan ini menunjukkan Selangor telah mencapai matlamat CBD, malah lebih tinggi daripada peringkat nasional.

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RIL IMPLEMENTATION IN SABAH: SUCCESS AND CHALLENGES

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ABSTRACT

A study on Reduced Impact Logging (RIL) in 1996 which was conducted in the Yayasan Sabah concession area shows that this technique has effectively reduced logging damage as much as 50 percent compared with conventional logging. The result has convinced the state government to adopt the RIL technique as one of the harvesting practices employed in the state of Sabah. Since then, many challenges have been encountered before this is finally accepted. The main challenge faced in the RIL implementation is to convince the logging contractors that RIL can be implemented technically and economically. The majority of the logging contractors are of the opinion that RIL is not profitable and technically difficult to implement. Furthermore, poor stocking of the forest due to past uncontrolled logging activities, along with their desire for extra profits and habit of bad logging practices have intensified their refusal to adopt RIL. This has resulted in the difficulties to fully implement RIL in Sabah. Despite these challenges, many efforts have been made by the Sabah Forestry Department, such as; to demonstrate that RIL is viable; to carry out continuous training; and to implement RIL in stages. This has been proven right in Deramakot with the proper planning and well supervised implementation. Meanwhile, RIL training courses that have been conducted continuously since 1996 by the Sabah Forestry Institute has produced a total of 4,431 peoples of RIL trained workers. RIL implementation is also fully regulated when a “System and Work Procedures” for Monitoring RIL was developed in 1998 to serve as a reference and guide for Sabah Forestry Department officials in carrying out monitoring works in a uniform and orderly manner. However, nothing much can be done to improve forest stock but to carry out rehabilitation activities. Nevertheless, with the availability of skilled manpower and implementation guidelines, the government has decided that RIL harvesting is mandatory in all Commercial Forest Reserve (Class II) beginning the 2010. Since the year 2000, approximately 200,000 hectares of forest areas have been logged using RIL techniques by not less than 17 licensees. In order to ensure credibility and transparency of the RIL system, the government of Sabah has appointed a 3rd party independent auditor to audit RIL implementation. This will facilitate the full implementation of forest certification in Sabah by year 2014.

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PROGRESS IN FOREST PLANTATION DEVELOPMENT IN SABAH

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ABSTRACT

As timber production from Sabah's natural forests declines, the shift of emphasis on production forestry to forest plantations is imminent. Forest plantations are generally characterized by fast-growing monocultures that produce high-yielding and short rotation (< 12 years) tree crops. Forest plantation development in Sabah first started in 1974 by Sabah Softwoods with an allocated area of 60,000 hectares. This was followed by SAFODA in 1976 with an area of 64,000 hectares. To date, some 560,000 hectares in Sabah have been designated for industrial tree plantations. Of these, only about 140,000 hectares have actually been planted thus far. Private forest concessionaires or FMU license holders are expected to lead the rapid expansion of forest plantations over the next few years. Labour shortage, however, is becoming a limiting factor. The Federal Government, through the Ministry of Plantations and Commodities, has approved loans totalling RM 1.045 billion for the purpose of plantation development in Malaysia since 2006. Of the 17 companies which were awarded loans, four of them are from Sabah. Common plantation species are Acacia and Batai. Native species, such as Laran and Binuang are also being planted on a smaller scale. The lack of sufficient planting materials and silvicultural knowledge limits the large scale cultivation of native species. Therefore, research remains an important factor in the advancement of plantation forestry in Sabah. The production of plantation logs has been on the rise, and plantation production in 2010 was recorded at 672,276.46 m³. A fully regulated plantation estate of 400,000 hectares in Sabah can be expected to yield about 7 million m³ annually. But until this becomes a reality, the local wood-based industry will likely experience a timber famine for the next 10 years before forest plantations can truly be a significant resource. Meanwhile, timber may have to be imported in order for the industry to secure sufficient raw material. The industry will need to adapt and adopt new technologies, in order to make use of the smaller and lower density timbers from plantations. Short-rotation plantations are usually associated with the industrial production of wood chips and the manufacturing of reconstituted wood products, such as particle board and medium density fibre board. Longer rotation plantations are necessary for higher value products, such as plywood and sawn timber. Sabah will need a mix of both short and long-rotation plantations to maintain a balance wood-based industry. Currently about 50,000 hectare of planted forests are certified in Sabah. While the Government encourages forest certification, current certification schemes pose difficulties to many new plantations due to the constraint imposed that forest plantations developed by clearing natural forests after 1994 are not certifiable.

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SOIL CARBON DENSITY UNDER FOREST PLANTATION TRIAL OF SELECTED TREE SPECIES IN SABAH

JUPIRI TITIN¹

ABSTRACT

Soil carbon plays an important role in producing desirable soil properties for plant growth as well as to improve soil resistance from degradation. It has been widely accepted as a major factor in forest health. Soil carbon increases site productivity by increasing soil fertility, soil moisture retention, aeration, mineral availability and the general soil structure. Globally, the soil carbon also affects the event of climate change through the dynamic of biospheric carbon in which soil carbon is one of the ecosystem carbon pools. A study was conducted at Sook and Segaliud-Lokan to investigate the changes in soil carbon density under forest plantation trial of selected trees species (*Acacia mangium*, *Falcataria moluccana*, *Gmelina arborea*, *Dryobalanops lanceolata* and *Shorea leprosula*). This quantification was based on the organic carbon content and bulk density of the soil samples collected up to 30cm in depth. The soil carbon density under the different tree species ranges from 23 to 39 t/ha.

INTRODUCTION

Soil plays a central role in the dynamics of biospheric carbon as well as in the event of global climate change. Soils in tropical forest has been reported to received the largest organic matter inputs from the growing plant , have the largest respiration rates due to the high moisture and temperature, and thus they are among the largest carbon reservoirs among world soils (Post et.al, 1990). The study to determine the carbon stock density in the soil was scarce in comparison to the assessment of carbon stock in above ground component due to the fact that such carbon is affected easily by the land-use change and also that carbon in the soil has a long turnover time. And detecting carbon accumulation in the soil is not an easy task. The main pathways of carbon in the soil include carbon input by leaf litterfall and roots and output by heterotroph (soil organisms) and tissue respiration.

Soil organic matter is a key component of the terrestrial ecosystem and any variation in its abundance and composition has important effects on many of the processes that occur within the system. The organic carbon in the soil is an important determinant of site fertility due to its role in maintaining soil physical and chemical properties. It is closely linked to site productivity by improving soil water holding capacity, lower soil bulk density, supplying nutrients to the plant, and providing much of the cation exchange capacity of the soil. Soil carbon also provides the energy source used by the soil belowground community in order to carry out the biochemical processes that drive nutrient cycling. Therefore, land-use and soil management practices can significantly influence soil organic carbon dynamics and carbon flux from the soil.

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THE ESTABLISHMENT OF SUSTAINABLE FOREST MANAGEMENT CONCEPT FOR KUALA BONGGAYA & KUALA LABUK (MANGROVE) FOREST RESERVE

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ABSTRACT

The Kuala Bonggaya & Kuala Labuk Mangrove Forest Reserve is situated in the state's administrative district of Beluran and under the jurisdiction of Beluran Forestry District's Office. It covers an area of 56,507 ha and an estimated perimeter of 1,375.1 km. The Kuala Bonggaya & Kuala Labuk (KBKL) forest reserve is also the biggest mangrove area in the state of Sabah.

Mangrove being a global issue, as well as being the last barrier from tsunami attacks, is only appropriate to have it managed in a sound and sustainable manner, a similar concept that is currently being practiced at Larut Matang, Perak. The KBKL mangrove forest reserve will be managed in accordance with the principles of conservation and sustainable use, whereas it will be a model development of which it will be utilised as a guide in the planning of other mangrove forest reserves management throughout Sabah. This information paper will summarize on the proposed establishment of a sustainable forest management unit for KBKL mangrove areas in accordance with the SFM principles.

INTRODUCTION

Mangrove forests have immense potential for revenue generation. Furthermore, mangrove forests which occupy extensive areas along the coast of Sabah have not been subjected to intensive forest management. Thereby its economic potentials have not been fully realised. Lessons learnt from other parts of the world suggested that mangrove forests can indeed be managed sustainably for the production of both tangible and intangible benefits. Hence, there is a need to further enhance the management strategy of mangroves in Sabah in particular, the implementation of the Kuala Bonggaya & Kuala Labuk Sustainable Forest Management. The project of Kuala Bonggaya & Kuala Labuk Sustainable Forest Management was initiated and approved by Sabah Forestry Department (SFD) under the 9th Malaysia Plan with funding from the Federal Government. The KBKL FR covers an area of 56,507ha and an estimated total perimeter of 1375.10 km. It is one of the largest contiguous areas of mangrove forests in Malaysia. It is located in the north eastern part of Sabah which is geographically situated between 117° 25'E - 117° 45'E and 5° 50'N - 6° 22'N (Figure 1).

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FOREST BIODIVERSITY INFORMATION SYSTEM (ForestBIS): A SYSTEM TO SIMPLIFY STORAGE AND RETRIEVAL OF INFORMATION IN REPOSITORY

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ABSTRACT

ForestBIS or Forest Biodiversity Information System was formulated with the main purpose to store systematically in centralized and digital format all available biological information kept in Forest Research Centre's (FRC) various repositories and also other related published data for easy retrieval of pertinent specimens' information by users. It is also aimed for easy retrieval of this data and information by researchers and other users. The continuous specimen collection and species recording undertaken in various field works in FRC has called for the setting up of ForestBIS. The system utilised MySQL software to store and manages the data. This paper will further deliberate and explain the various phases and categories of the system, the various data and information it contains, how to use it for the benefit of potential users as well as its limitation.

INTRODUCTION

ForestBIS or Forest Biodiversity Information System was formulated with the objective to set up a centralized biodiversity database system in FRC/SFD. It was funded by the State RMK-9 Development fund and was set up with the main purpose to ease and simplify data storage and accessibility to FRC researchers and other potential users. Before the introduction of ForestBIS in FRC, there were more than three database systems which were running in different stand-alone system and inaccessible to others as they were not connected into FRC's intranet system. In addition, most of these data are inter-connected to each other, though they were kept and stored in thus different database system. Due to this limitation, a centralized database was mooted.

The project involves a number of sections that undertake biodiversity related studies and specimens collection. The project was monitored through a Project Steering Committee and Technical Committee to spear-head and guide the implementation of this project. The project steering committee was chaired by the Head of FRC, whilst the Technical Committee was chaired by The Project Manager.

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AN OVERVIEW OF MANAGING THE LOWER KINABATANGAN SEGAMA WETLANDS (LKSW) RAMSAR SITE

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ABSTRACT

The LKSW was successfully listed at the 10th Ramsar Convention in Changwon, Korea on 28th October 2008 as the sixth Ramsar site of Malaysia. The area consists of 78,803 ha comprising three forest reserves: Trusan Kinabatangan Forest Reserve (40,471 ha), Kulamba Wildlife Forest Reserve (20,682 ha) and Kuala Maruap and Kuala Segama Forest Reserve (17,650 ha). Ensuing from the listing, the LKSW Ramsar Site Management Plan was formulated in 2010, under the auspices of the Sabah Biodiversity Centre (SaBC) and with the support from Japan International Corporation Agency-Borneon Biodiversity Ecosystem Conservation II (JICA-BBEC II). The management plan generally recommended actions for implementation within the core area which is the Forest Reserves, and the buffer area which covers the entire Kinabatangan catchment area.

This paper briefly describes the management plan, current progress of LKSW Ramsar site, highlights the importance of LKSW wetlands and the issues and challenges in managing the biggest Ramsar site in Malaysia.

INTRODUCTION

Wetlands are among the most productive ecosystems in the world. A source of substantial biodiversity, they provide support to a variety of species ranging from the tiniest microbes to assorted mammals, a plentitude of agricultural activities and fisheries. Most importantly, wetlands maintain the livelihood of millions living in local communities in and around the wetlands and their drainage basin.

For Sabah, the Lower Kinabatangan Segama Wetlands (LKSW) which is located in the district of Kinabatangan was designated as a Ramsar site on 28th October 2008 during the 10th Conference of Parties (COP10) Ramsar Convention in Changwon, Korea. The LKSW Ramsar site is the 1,849th Ramsar site in the world and consists of three Forest Reserves (Trusan Kinabatangan Forest Reserve – 40,471 hectares, Kulamba Wildlife Forest Reserve – 20,682 hectares and Kuala Segama Forest Reserve – 17,650 hectares). It is the 6th and biggest Ramsar site in Malaysia and possibly the largest forest-covered floodplain in Southeast Asia.

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BIODIVERSITY INFORMATICS IN IUCN RED LISTS ASSESSMENT: RARE, ENDEMIC AND ENDANGERED DIPTEROCARPS OF SABAH

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ABSTRACT

With the rapid decline of the natural forest ecosystem, much has been done to study and conserve the mentioned ecosystem. Efforts are needed to compile the bio-geographical and ecological data sets collected through extensive surveys and expeditions in order to generate an overall picture of factors influencing species population distribution. In collaboration with Aberdeen University, we have implemented the application of biodiversity informatics, in generating predictive models such as Ecological Niche Models (ENMs) to look at Dipterocarp species population distribution. In view that the Dipterocarpaceae is one of the dominant tree families that is found in Sabah, we have decided to use species within this family as a model. The ongoing study is focused on species which are rare, endemic or endangered. Aside from generating models to provide an overview of population distribution of the species in study, the information obtained can be used for sustainable management, restoration, protection and conservation of both species and the forest ecosystem.

INTRODUCTION

Borneo is the third largest island in the world and has been known to harbour the world's oldest rainforests with a rich history of 130 million years old. It should be of no surprise that it is one of the centers of evolution and radiation for endemism in both plants and animals. Out of the land mass of 743,330 km² in Borneo, the state of Sabah occupies 10% of the total area. To date, approximately 48.17% of the total land area is designated as Permanent Forest Estate (PREs) (Sabah Forestry Department, 2010). Even though much of the land have been gazetted as forest reserves that does not mean that they would be safe from any immediate threats such as forest fires, forest edge effects or shifting agriculture, which will consequently lead to the loss of habitats and in the worse scenario species extinction.

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ADDRESSING FOREST CONNECTIVITY WITHIN THE HEART OF BORNEO (HoB) LANDSCAPES IN SABAH: ISSUES AND CHALLENGES

ROBERT MARTIN MIJOL¹

ABSTRACT

The Sabah Forestry Department (SFD) had implemented the HoB initiative in the state with funding support from the Ministry of Natural Resource and Environment (NRE) under the Ninth Malaysia Plan Mid-Term Review with an amount of RM5 million and was subsequently extended into the Tenth Malaysia Plan. The main objectives are to conserve and manage a network of protected areas, and to promote sustainable management of the productive forest and the implementation of sustainable land-use practices adjoining these protected areas to ensure connectivity. Various activities such as biodiversity and wildlife expeditions, the establishment of the Wildlife Protection Unit (WPU) and facilities of field outposts were implemented. The bigger challenges next, would be demonstrating how forest connectivity can be restored and remained functional within the fragmented nature of existing protected areas and surrounded by human activities. To demonstrate this, the Sabah Forestry Department had identified the Telupid Forest Reserves Complex (TFRC) as the model area for the HoB initiative. The TFRC consists of six protected forest reserves of various types of low-land and high-land forest areas, i.e. Ulu Telupid, Lipaso, Bidu Bidu, Bukit Kuamas, Bukit Taviu and Tawai, with varying degrees of degradation and are surrounded by various agricultural and community activities. The Conservation Management Plan (CMP) which is being finalised, outlines the programs and activities to be implemented in the next ten years beginning in 2011. This paper discusses the recommended strategies and offers some practical solutions on the best way forward to address forest connectivity while advancing the interest of sustainable development within the Telupid Forest Reserves Complex (TFRC).

INTRODUCTION

The Heart of Borneo (HoB) initiative covering about 200,000 square kilometres which is ecologically inter-connected within three countries i.e. Indonesia (Kalimantan), Malaysia (Sabah and Sarawak), and Brunei Darussalam is home to the biologically diverse habitats for plants, insects, birds and big mammals. The central highlands are the location of the headwaters of Borneo's major rivers, some of which flow for thousands of miles before they reach their estuaries. The protection of this area is therefore critical in ensuring clean water supplies to a large number of human settlements.

The HoB area in Sabah covering about 4 million hectares of the State's land area (Figure 1) comprising of varying land categories i.e. Forest Reserves, alienated land, agriculture, township, etc., makes up the largest chunk of the proposed HoB area in Malaysia. This includes the Ulu Segama-Malua Forest Reserves which were declared by the State Government for the conservation of orang utans.

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FOREST LAWS AND ENFORCEMENT IN SABAH: THE WAY FORWARD

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ABSTRACT

Forest Laws and Enforcement in Sabah are tools to combat the threats posed to forests from illegal logging, evasion of royalty, encroachments and other related offences. Protection is one of the underlying principles of Sustainable Forest Management, which has been focused as the main agenda of the State Government. Together with this, the Forest Enactment, 1968 and Forest Rules, 1969 are the two principle forestry laws, which provide for the gazettement of forest reserves, their use and management as well as for control of cutting and removal of forest produce from the Forest Reserves (Class II) and state lands. Illegal logging and forest encroachments have far reaching environmental, social and economic consequences, including loss of biodiversity and habitats, political instability, increased income disparities and market distortions. All these issues are difficult to address and they require time and investments to bring about significant changes. Between 2001-2010, the Sabah Forestry Department has made tremendous improvements on addressing forest crimes and have organised numerous investigation and prosecution courses. To date, the Sabah Forestry Department has trained its staff ranking from Forest Rangers right up to Forestry Officers throughout the state. These efforts initiated by the department, has shown positive results of which, the rate of forest crimes has declined drastically. From 2001-2010, a total of 1558 offenders have been booked or arrested and during the same period, the Forestry Department had also confiscated 1870 logging machineries that were used in the illegal operations and imposed RM19,146,898.80 in fines and penalties. A total of 283,338.46m³ of logs valued at RM19,050,225.65 million were confiscated and auctioned. Various efforts have been implemented by the department in addressing forest crimes and one of them is the recruitment of the Honorary Forest Rangers. Continuous training and workshops have been organised to upgrade the quality of the enforcement officers. The latest development initiated by the Sabah Forestry Department was to equip all Forestry Officers with firearms, which are mainly used for self-protection and a deterrent against the perpetrators.

INTRODUCTION

The World Bank has reported that forest crimes such as illegal logging, illegal occupation of forest reserves, wildlife poaching, and encroachments of forest reserves were rampant throughout the world (World Bank, 2006). It has been further reported and estimated by the World Bank that the governments of some of the poorest countries in the world lose over \$15 billion per year as a result of illegal logging (EFI Policy Brief, 2008)

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POTENSI SUMBER AIR MINERAL SEMULAJADI DI HUTAN SIMPAN BUKIT TAVIU DAN KESESUAIAN UNTUK DI KONSUMSI OLEH MANUSIA: MENAFAAT DAN FAEDAH UNTUK KESIHATAN ORANG RAMAI

SAMIN SALIM¹ DAN MOHD RAZALI²

ABSTRAK

Air merupakan media terpenting yang sangat diperlukan tubuh badan untuk sihat. Tubuh badan manusia terdiri daripada 80% air, dimana setiap organ terpenting menyimpan air pada kadar tertentu untuk sihat dan berfungsi dengan baik. Jika perubahan kandungan air dalam badan sebanyak 10% akan mendatangkan masalah kesihatan. Perubahan air sebanyak 20% dalam badan akibatnya adalah kematian (Dr. Mohd Hasni, 1982).

Air bersih dan mengandungi cukup mineral essential sangat diperlukan untuk membantu melindungi tubuh badan dari malnutrisi mineral. Air yang mengalir ke permukaan tanah secara semulajadi dikenali sebagai mata air (*spring*). Air semulajadi dari mata air yang terletak di Hutan Simpan Bukit Taviu, daerah Ranau di kilometer 170.5 jalan utama Kota Kinabalu - Sandakan, adalah didapati mengandungi mineral semulajadi. Orang ramai pengguna jalan tersebut sudah sekian lama memanfaatkan air tersebut sebagai air minum sepanjang perjalanan ke destinasi mereka tanpa dimasak terlebih dahulu. Penduduk kampung di sekitar kawasan ini, telah bertahun-tahun mengambil air tersebut sebagai air minum harian mereka. Pengalaman beberapa orang penduduk kampung mendakwa, air mineral semulajadi ini ada keistimewaan tersendiri. Hasil kajian yang dilakukan untuk menganalisis kualiti air (kekeruhan, rasa, bau dan suhu), kandungan mineral *essential*, analisis mikrobiologi (*fecal coliform* dan *total coliform*), dan analisis kimia khususnya logam berat yang terkandung dalam air mendapati bahawa, kualiti dan kandungan mineral dalam air tersebut adalah menepati piawaian kualiti air minum di Malaysia.

PENDAHULUAN

Air merupakan bahagian terbesar yang meliputi 70% permukaan bumi. Air sangat diperlukan untuk semua hidup dan kehidupan. Disimpulkan bahawa, ada air ada kehidupan, tanpa air tidak ada kehidupan. Tentunya air yang diperlukan oleh manusia adalah air tawar yang bersih dan berkualiti untuk air minum dan keperluan harian dalam kehidupan. Sumber air tawar adalah sungai, tasik, air hujan dan air tanah. Di Malaysia, sumber air utama adalah air sungai, tetapi malangnya dalam kepesatan pembangunan dimana berkembangnya bandar dan kegiatan perindustrian serta perdagangan, kualiti air sungai mula mengalami kemerosotan apabila berlakunya masalah hakisan, pemendapan, pencemaran dan sering menjadi tempat pembuangan sisa-sisa domestik dan sikap manusia yang menganggap sungai sebagai saluran mudah untuk membuang segala sampah, kotoran haiwan dari kandang ternak, pembangunan tanah, aktiviti pertanian, bahan-bahan kimia yang terdapat dalam racun rumpai, racun serangga, baja kimia turut mencemari sungai (Halizah, 2007).

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STRATEGIES AND ACTION PLANS FOR THE LONG-TERM SUSTAINABILITY OF KUCHING WETLAND NATIONAL PARK (KWNP) IN SARAWAK

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ABSTRACT

Kuching Wetland National Park, which covers a total area of 6610 hectares, was gazetted in 2002 as a Totally Protected Area (TPA) for the purpose of wetland and became the first RAMSAR site in Sarawak in 2005. The national park consists of a deltaic mangrove system, with an extensive streams and rivers and tidal creeks. Stresses caused by anthropogenic and natural factors to the Totally Protected areas were identified and numerous strategies and actions plans are currently or will be implemented to address these problems to ensure the long-term sustainability of the national park. Apart from the long-term monitoring of the ecosystems and their biodiversity as well as surveillance of encroachment in the TPA, community participation in wetlands conservation in Sarawak is given emphasis. Engagement of the local communities is a priority in implementing the strategies and action plans. These include the promotion of sustainable livelihood among the local communities to reduce pressure on the park such as the introduction of ecotourism including the upgrading of infrastructures and park's facilities, conservation awareness programme as well as the establishment of the Special Park Committee (SPC). It is hope that through these community-based initiatives, long-term sustainability of the wetlands totally protected areas can be achieved.

INTRODUCTION

Located in the western part of Sarawak, approximately 15 km NNW of Kuching City, Kuching Wetland National Park (KWNP) lies between N01° 40' 59" – N01° 41' 18" latitude and E110° 12' 16" longitude. The total area, approximately 6610 hectares, has been gazetted as a Totally Protected Area under the National Parks and Nature Reserves Ordinance (1998) in 2002. This area was actually the remnant of the once formerly extensive Sarawak Mangrove Forest Reserve, gazetted in 1924, that covered approximately 17,153 ha. Recognising the ecological significance and uniqueness of the area, the Sarawak State government designated the park as RAMSAR site in November 2005.

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MAPPING OF THE INDIGENOUS FRUIT SPECIES FOR THE CONSERVATION OF GENETIC RESOURCES IN THE TOTALLY PROTECTED AREAS IN SARAWAK

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ABSTRACT

Sarawak is located in one of the twelve mega centres of biological diversity. As such, it contains a rich diversity of indigenous fruit species. The most common and well-known fruits species are dabai, engkala, isau, lansat, manggis, maram, rambutan, tampoi, and varieties of *Artocarpus*, *Baccaurea*, *Durio*, *Mangifera* and *Nephelium*. Many of the indigenous fruit species have been commercialised and cultivated throughout Sarawak. Among the most popular and widely cultivated are dabai, durian, isau, lansat, manggis, mempelam and rambutan. However, there are many lesser known species still growing wild in the natural forest. In view of the importance of the indigenous fruit species, the Forest Department has initiated an effort to map the distribution, catalogue and record the species found in Sarawak. Hence, the department has established the Wild Fruit Orchard as part of the conservation programme. This paper will discuss the distribution pattern of some selected indigenous fruit species in the selected National Parks and efforts to conserve the genetic resources in Sarawak. Some constraints and challenges in the conservation of indigenous fruit species will be highlighted as well.

INTRODUCTION

Sarawak is blessed with tropical climate with a pronounced wet and dry season. Due to its ideal climate, Sarawak is covered with green and flourishing rainforest that is rich in flora and fauna. As forests are home to an abundant variety of plant and animal life, many of which are endemic only to this part of the world, several tracts of natural forest have also been designated National Parks and Wildlife Sanctuaries and declared Totally Protected Area.

In 1919, Forest Department was set up with explicit purpose of managing and conserving the State's forest resources. Since then it has been actively advocating and practising conservation as early as the 1950's when it introduced the Forests Ordinance (Cap. 126), National Parks and Nature Reserves Ordinance (Cap. 27) and Wildlife Protection Ordinance (Cap. 26).

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ETHNOBOTANICAL INVENTORY OF MEDICINAL PLANTS IN SARAWAK

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ABSTRACT

The paper reports on the ethnobotanical inventory of medicinal plants traditionally used by the different ethnics in Sarawak. Sarawak's forest is known to be one of the oldest and richest tropical rainforest in the world therefore it is rich in flora diversity. Ethnobotany plays an important role in the lives of the indigenous communities in Sarawak. Before modern medicines existed, the indigenous communities from Sarawak's interior areas rely on medicinal plants to cure them of sickness. They used medicinal plants for treatment of digestive, respiratory, urinary and other illnesses. The aim of the study is to document a complete inventory of ethnobotanical plants collected in Sarawak. This inventory will be based on the herbarium specimens kept in Sarawak Herbarium (SAR). Currently there are an estimated total of 4641 specimens from 165 families and 1279 species categorized under ethnobotanical plants. These specimens were collected by botanists of Sarawak Forest Department and other botanist from other institutions recorded back in the 1970's until recently. Local communities have practiced traditional cures from their ancestors and the medicinal knowledge has been passed down from generations. The medicinal properties and usage information of these plants were obtained from local communities during fieldworks. Botanist also conducted interviews with local elderly people, local healers and midwives and recorded their knowledge of medicinal plants for future reference and databasing purposes. The results from this study will ensure a complete and up to date inventory of ethnobotanical plants in Sarawak as well as preserving the important uses of these plants for future generations. This study also contributed to the update of ethnobotanical flora database in SAR.

INTRODUCTION

Sarawak is significantly the largest state in Malaysia with a total of 12.32 million ha land area and covers up a total 16% of Borneo tropical rainforest. There are 5 major forest types in Sarawak and is consist of primarily mixed dipterocarp forest followed by peat swamp forest, mangrove forest, Kerangas forest and montane forest. This suggests that the forest ecosystem is extremely diverse and is primarily due to the various geographical area, soil structures and climatic environment. Sarawak is contained within the 25 biodiversity hotspots in the world determined by the high flora species richness and diverse ecosystems.

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CONSERVATION EFFORTS OF THE BIOLOGICAL COLLECTIONS IN SARAWAK

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ABSTRACT

Biological collections have been playing a vital role in taxonomy and ecological studies. They are typically preserved plant or animal specimens with specimen documentation, such as labels and notations. In Research, Development and Innovation Division, Forest Department Sarawak, there are herbarium collection, insect collection, fungi collection, wood samples collection and wet museum collections. The Sarawak Herbarium hold almost 270,000 plant collections since first established in 1961 with the oldest specimen, *Cyanandrium rufum* of Melastomataceae family which was collected in May 1890. The Insect collections were kept according to areas of collections and an extensive collection was from Lambir Hill National Park. The fungi collections are the most fragile collections because of the rareness of the fungi and mushrooms. Fungi and mushroom are not like trees, they grow and they die. If not collected, we won't know where they will grow next. In this paper we would like to share our activities on the conservation efforts of the biological collections kept in the Research, Development and Innovation Division in Forest Department Sarawak. As we know, biological collections support a whole range of disciplines and professions for which the end product is valued but the role of the collections in it is often unnoticed.

INTRODUCTION

The main purpose of the Research, Development and Innovation Division is to provide central facilities for reference and research on specimens of all plants, insects and fungi in Sarawak. Ideally, it will be a one-stop centre for forestry research. Previously this division was known as the Forest Research Centre, however with the rebranding of the Forest Department, this centre is now known as Research, Development and Innovation Division. Currently, the division is made up of two subdivision namely subdivision Biodiversity and subdivision Environment. Biodiversity Subdivision housed the botanical collections, Insects collections, fungi & mushroom collections and wood anatomy collections. This subdivision is also taking care of the herbarium which provides references for plants collected in Sarawak, the insectorium for insect reference and fungarium for fungi identification. Whereas, the Environment subdivision is managing the Forest Conservation Unit, Forest Ecology Unit and Soils Unit.

¹ Research, Development and Innovation Division, Forest Department Sarawak

OUTDOOR STRUCTURAL APPLICATION OF PLANTATION GROWN *ACACIA MANGIUM*

LAI JIEW KOK¹ AND JOHN SAMMY¹

ABSTRACT

Acacia mangium is a popular plantation species widely grown in Malaysia. This fast-growing species was originally introduced to Sarawak to feed for the proposed pulp and paper mill at Tatau, Bintulu Division. Over the last few years however, attempts have also been made to utilize the species for other more value-added purposes such as plywood, pallet and even furniture. Due to the inherent characteristics and 'defects' associated with such fast-growing species, the scope of utilisation remains limited and there is lingering lack of confidence in the structural application of local-grown *Acacia mangium*. In order to address this issue, the Timber Technology Centre (TTC) of Sarawak Forestry Corporation has designed and completed a 20-bay car park using *Acacia mangium* timber as raw materials. All the columns and trusses have been fabricated from glue-laminated *Acacia mangium* and chemically treated to enhance durability. The structural members have been tested to ensure compliance with the relevant international standards or code of practice.

INTRODUCTION

In Malaysia, the local construction industries have for years utilize high-quality timber for their housing and building requirements obtained from our country's natural resources. However, with the fast depleting supply of timber from our natural resources, the government Recognising the seriousness of the problems had implemented and given full support to forest plantation program in the country with the intention to supplement timber supply in the future.

Despite the competitive challenges from synthetics alternatives as a building material, timber has remained superior and in demand till today. A comparative study conducted by (Anita Firmanti, Kohei Komatsu, and Suichi Kawai, 2007) of timber and synthetic alternatives, as materials for single-storey houses, as well as buildings, showed that timber is an environmentally superior building material. In their studies on *Acacia mangium Willd.*, they also deduced that *A. mangium* timber could be a substitute structural material for light timber construction when the timber is mechanically graded resulting in effective utilisation of the timber.

Acacia mangium is among one of the most widely planted plantation hardwood timber species in the country, including the state of Sarawak. In Sarawak, it was introduced specifically to feed the proposed pulp and paper mill at Tatau, Bintulu Division. However for its worth, *Acacia mangium* though basically intended for the pulp and paper manufacture

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IUCN RED LISTED DIPTEROCARP SPECIES IN SARAWAK: WHAT DO WE KNOW NOW?

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ABSTRACT

A project to re-assess the conservation status of dipterocarps in Sarawak was initiated in 2008 as more than 70% of the species that occurred in Sarawak are listed in the IUCN Red List. This listing has negative implications for Sarawak in terms of timber trade with some European countries. The re-assessment was done on species that are endemic to Sarawak as well as species that also occur in Peninsular Malaysia and Sabah. The species which are currently categorized as threatened but rather common and abundant in Sarawak include species such as *Shorea sagittata* P.S.Ashton, *Shorea leprosula* Miq., *Shorea maxwelliana* King and *Dipterocarpus globosus* Vesque. The review of the conservation status of the species in the IUCN Red List could be suggested for species that are endemic to Sarawak or Malaysia; however for species in Sarawak that are also occur in other countries, reviewing of the global IUCN Red List will need inputs from those countries having the species. In this paper, the results of the current conservation status of some dipterocarps species in Sarawak will be discussed.

INTRODUCTION

Within Malaysia and Borneo, Sarawak is the richest state or region for the dipterocarps with 247 species including subspecies (Ashton, 2004). Ecologically, the family Dipterocarpaceae is also the most abundant trees in major forest types that formed the medium and upper stories of forest in Sarawak. Economically, for decades the dipterocarps are the most important source of valuable timbers particularly in Southeast Asia (Soerianegara & Lemmens, 1993; Ashton, 2004). They are traded under the timber groupings such as *Mera ti*, *Keruing* and *Kapur*. Despite their contribution to the economic sector, the dipterocarp species in Sarawak as well as those occurring worldwide are facing various degree of endangerment due to various threats such as habitat loss caused by forest conversion, agriculture and other forms of development. In Sarawak, a total of 167 out of 247 species are considered threatened (IUCN, 2010). In view of the importance of this group both economically and ecologically, there is a need to re-assess the conservation status of the dipterocarps in Sarawak to ascertain their degree of endangerment.

A project to re-assess the conservation status of dipterocarps in Sarawak was initiated in 2008 as almost 70% of the species that occurred in Sarawak are listed in the IUCN Red List 2010. So often, the dipterocarp family as a group is always assumed as common and

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GETTING IT RIGHT: GROWING KELAMPAYAN (*NEOLAMARCKIA CADAMBA*) IN THE FIELD

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ABSTRACT

Considering that the state government is targeting one million hectares of planted forest by 2020, it would be beneficial for the plantation and timber industries to have indigenous species planted at a large scale together with exotic species to meet the different demand of timber industries. To date, out of 376,507 hectares planted in Sarawak, more than 70% are exotic species with Acacia being the most popular and indigenous species such as Kelampayan occupy less than 10%. Among the indigenous species, Kelampayan (*Neolamarckia cadamba*) is the most promising fast-growing tree that has a great potential to be used as a plantation species. However, it is still not the planter's favorite choice in Sarawak. This is because despite having all the good characteristics and usefulness of the timber, it is considered as a problematic species to plant. It was observed that the most tender age or critical stage of Kelampayan planted in the field is the first 6 months after planting. Once the seedling has passed this stage, it is almost assured that it will grow into a harvestable tree. Therefore it is the aim of this paper to highlight those important stages in order to get the seedlings to grow beyond the tender age. The results and discussion are based on the field planting trials at three different sites using the same technique and method which has been developed by SARAWAK FORESTRY. The initial rate of seedlings survival in these three sites was in the range of 80 to 96% and the seedlings are still in good form. The details of the findings including growth performance and MAI of the trees would be highlighted in the paper.

INTRODUCTION

Among the indigenous species, Kelampayan (*Neolamarckia cadamba*) is the most prominent and promising fast-growing tree that has great potential to be used as a plantation species. However, it is still not the planter's favorite choice in Sarawak. This is because despite having all the good characteristics and usefulness of the timber, it is considered as a problematic species to plant. To date, out of 376,507 hectares planted in Sarawak, more than 70% are exotic species with Acacia being the most popular and indigenous species such as Kelampayan occupy less than 10%.

It is somewhat true that kelampayan is seems to be a difficult species to plant especially if the planters are planting it like other well known and adaptable species such as Acacia. Planting kelampayan requires extra effort to enable it to grow at least beyond

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GROWTH AND YIELD ESTIMATION FOR *ACACIA MANGIUM* WILLD. IN PLANTED FORESTS OF SARAWAK

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ABSTRACT

Acacia mangium is a fast-growing species belonging to the family *Leguminosae* that has been introduced to the forest plantations in Malaysia for its desirable properties which include rapid growth, good wood quality and tolerance to a wide range of soils and environments. It constitutes about 70% of the total 376,507 ha established till 2010 in the Licensed Planted Forest (LPF) of Sarawak. This study is aimed at estimating growth and yield for *A. mangium* using the simultaneous prediction equation method. Trees ranging from age 2 - 10 years of age were randomly sampled in even-aged stands of *A. mangium* to estimate the stand dominant height, stand diameter, stand basal area per hectare and total volume yield per hectare. In general, mean diameter increases fairly rapidly up to 17 cm in stands less than 4 years old. Results show that growth rate slows noticeably after the fifth year and the diameter begins to level off at around 20 cm by the age of 8 years. In the first 2–3 years, height increases moderately up to 11–15 m and then increases sharply up to 25 m at about 5 years. The mean annual increment (MAI) for diameter ranges from 1.3 to 7.5 cm/year while the MAI for height ranges from 1.5 to 5.6 m/year. A height MAI of more than 4 m/year was recorded in stands of age 4 and above.

INTRODUCTION

Acacia mangium is a fast-growing species belonging to the family *Leguminosae* that has been introduced to the forest plantations in Malaysia for its desirable properties which include rapid growth, good wood quality and tolerance to a wide range of soils and environments. It constitutes about 70% of the total 376,507 ha established till 2010 in the Licensed Planted Forest (LPF) of Sarawak.

Plantation forestry is a relatively high input economic activity. Therefore, plantations established for industrial purposes (saw timber, pulpwood and plywood, pitprops or poles, fuelwood, small timber, fodder, etc.) form the primary objectives of plantation establishment. Plantation management decisions about choice of species, spacing, rotation age, thinnings and other silvicultural treatments must be directed to achieve these goals. There are a few examples where, due to proper planning, good management and the application of tree breeding it has been possible to achieve high productivity but there are numerous examples where wrong decisions and poor management strategies have yielded lower figures than expected.

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BAKO BUNTAL BAY FLYWAY INITIATIVE

SIM LEE KHENG¹ AND OSWALD BRAKEN TISEN¹

ABSTRACT

Migratory birds are a vast yet interesting group of vertebrates which do not recognise international boundaries. They fly thousands of kilometres from their breeding grounds in the north to their wintering grounds in the south; stopping over to refuel in countries in the tropics as well as in the southern hemisphere. Sarawak is an important site for refuelling, where Bako Buntal Bay holds 10 percent of the world's population of the highly endangered Chinese egrets. Countries located in the wintering grounds as well as refuelling grounds should cooperate to ensure the continual survival of migratory birds. This leads to the Flyway Initiative. Bako Buntal Bay is such a site recognised as an important feeding ground which should be included as a Flyway network site. This paper presents information on its importance as a feeding ground for the birds as well as provides insight for the establishment of Bako Buntal Bay as a Flyway network site.

INTRODUCTION

Birds and migration

Migratory birds are a vast yet interesting group of vertebrates which do not recognise international boundaries. They fly thousands of kilometres from their breeding grounds in the north to their wintering grounds in the south; stopping over to refuel in countries in the tropics as well as in the southern hemisphere. They are a special group of birds which are dependent on wetlands as their refuelling grounds after navigating through large expanses of land and avoiding huge water bodies. For the purpose of this paper, the group of birds comprises the order Charadriiformes and also egrets and herons. Migration is a “costly” feat, requiring extensive supply of energy which explains why migratory birds undergo physiological changes before the process to enable them store fat before the long journey.

Migratory shorebirds need to be efficient feeders; they need to eat up to one-third their body weight daily to fuel their active lifestyles as well as to build up fat reserves for their long migrations. Studies have shown that they double their body weight before leaving their breeding grounds for areas which are more conducive, stopping to “refuel” en-route to their wintering grounds and return. Therefore, staging areas are essential to allow these birds to replenish their reserves, without which they may not survive to breed. Countries located in the wintering grounds as well as refuelling grounds should cooperate to ensure the continual survival of migratory birds. This leads to the Flyway Initiative.

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