

Malaysia's Case study of Forest Resources Management and Development

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ABSTRACT

Forest resources development is one of the terms in forest development planning and forest development resource. Similarly, it always involves the effects and impact toward the surroundings, especially regarding human life. This study shall define environmental forest resources development and the forest management in the Malaysian context for assisting the nation in achieving the target of maintaining sustainable development for the country. As a rapidly developing country, Malaysia needs resources, especially environmental resources. Development of environmental resources has led to rapid enhancements of its economy manifesting as the positive changes in the cultural landscape of the country. This paper will discuss the review of environmental management and environmental resources in Malaysia. Nevertheless, forest is one of the part of environmental component highlighted in this paper. Therefore, this paper reveals the important things of knowledge associated with forest and the forest management in Malaysia.

Keywords: *Environmental Management, Forest Management, Environmental Resources, Development and Malaysia.*

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INTRODUCTION

The forests of Malaysia have been systematically managed with the establishment of the Forestry Department in 1901, whereby ecologically and environmentally sound forest conservation and management practices have been developed to ensure forest renewal and sustained yield. In the early 1920s, forest management by Departmental Regeneration Improvement Felling (DRIF) was aim solely at improving the existing stock through

removal of inferior species (Wyatt-Smith and Panton, 1995). However, with rising demand for firewood and poles from the mining industries in the 1930s, Commercial Regeneration Improvement Felling (CRIF) was introduced. A few years after the Pacific War, Regeneration Improving Felling (RIF) was discontinued because of the increased demand for raw materials. This led to the formulation of the Malayan Uniform System (MUS) in 1948, which consists of removing the mature crop in one single felling of all trees down 45cm dbh for all species. The evolution of forest management studies was documented with the chronological attempts by Malaysia toward achieving the aim to become a developed country. Forest resources development is one of the terms in forest development planning and forest development resource. Similarly, it always involves the effects and impact toward the surroundings, especially regarding human life. Economic development is more stressed on the circle of life. Even though Malaysia aims toward becoming a developed country, at the same time, the most important concern is about the quality of life while achieving better economic status levels. Forest is one of the environmental resources that always becomes an important factor in formulating new strategies in any development plan. Main components in the environment, namely water, air, land, and ecology as a part of forest would rely on each other. There are many studies related to the impact and effects on the environment when projects focusing on development are performed. From the beginning until the end of the project, the situation would become problematic if they do not obey the rules and regulations as established by the authorities. This study shall define environmental forest resources development and the forest management in the Malaysian context for assisting the nation in achieving the target of maintaining sustainable development for the country.

Study Region – Malaysia As A Developing Country

Since the Independence in 1957, Malaysia has embarked on a progressive path to improve the social and economic standing of the country and its citizenry, by steadily developing high rates of economic growth combined with significant reduction in poverty and unemployment levels, as well as addressing other socio-economic imbalances. The force behind these early achievements were laid out under the nation's comprehensive Outline Perspective Plans, which included detailed Five-year Malaysia Plans and strategic policy initiatives that sought to eradicate poverty, restructure society, sustain growth, and maintain national unity.

The Malaysian economy has undergone rapid transformation since the Independence in 1957. At the time of Independence, the economy was precariously dependent on two primary commodities, namely rubber

and tin, and the prices of which were highly volatile. Consequently, the economy was very vulnerable to fluctuations in primary exports. Export diversification was one of the first measures taken after the Independence. Palm oil, pepper, cocoa, and pineapple were among the new commercial crops geared primarily for the export market. Manufacturing was introduced for purposes of import substitution under mild tariff protection. Malaysia has experienced phenomenal economic growth in the last two decades. It has undergone a major structural transformation, moving from an agricultural-based to manufacturing-based economy with significant social changes. This rapid development has brought about significant impacts to the natural environments.

Malaysia was chosen as the subject of interest because it is described as one of the fastest growing developing countries in Southeast Asia, East Asia, and the world. As a rapidly developing country, Malaysia needs resources, especially environmental resources. Development of environmental resources has led to rapid enhancements of its economy manifesting as the positive changes in the cultural landscape of the country. However, environmental resources development has its negative effects and impacts, and this provides the challenge for Malaysia to establish sustainable development programmes at the national and international spatial scales. Forests have played an important role in the resource based socio- economic development of Malaysia. In accordance with Malaysia's Federal Constitution, the legislative control of land and forests is a state matter and the state governments have complete jurisdiction over their respective forest resources.

Environmental Management

Generally, human systems need resources to evolve. Environmental characteristics such land, soil, hydrology, climate, and the whole rubric of flora and fauna have values that can be translated into resources. The rapid growth of population during the 20th century has increased pressure for more land made available for agriculture, resource exploitation such as quarrying, mining, and forestry, and for city expansion to cope with the increasing population and urbanization (Derbishyre & Owen, 1997). Environmental resource development could also characterize the Gross Domestic Product (GDP) of a country. The higher the GDP the more intense the development of a country's environmental resource base. For instance, one of the fundamental drivers for evolution of the European energy system is future activity growth, which is characterized by strong uncertainty in the aftermath of persisting slowdown of GDP growth in the EU, due to the recent economic and debt crises. Alternative growth projections would have significant implications

on the projected EU energy demand and supply, and the associated GHG emissions, as higher GDP would directly lead to higher energy demand and thus to increased emissions. According previous researchers (Ec, 2011; Kriegler et al., 2013), this increase can be moderated, as higher economic growth allows for faster capital turnover so that higher amounts of energy efficient equipment enter the capital stock sooner, and thus the overall energy intensity of GDP would decline. Moreover, it has been proven that investment in low and zero carbon technologies as well as in energy efficient techniques can be stimulated by high economic growth (De Cian et al., 2013). This would lead to the reduction of energy intensity for every unit of economic activity (Capros et al., 2015). Meanwhile in developing countries, Kandil (2015) showed that the variability of the exchange rate is less pronounced, thus reflecting a more stabilized exchange rate system, as compared to the more advanced countries.

An environmental resource is not able to stand on its own without exploration to generate resources for humans and other wildlife to continue with their lives. Generally, the human era is different according to civilization (Kerry, 2007). Environmental stress has often been seen as the result of growing demand on scarce resources and pollution generated by the rising living standards of the relatively affluent. However, poverty itself pollutes the environment, creating environmental stress in a different way. Those who are poor and hungry will often destroy their immediate environment in order to survive. They will cut down forests; their livestock will overgraze grasslands; they will overuse marginal land; and in growing numbers they will crowd into congested cities. The cumulative effect of these changes is so far-reaching as to make poverty itself a major global scourge (United Nation, n.d.).

Developing countries are different from developed countries in terms of development. Many developing countries in the world have explored their resources to generate income for their countries. They need to carry out the exploration of resources to fulfil their needs for achieving comfortable living. The exploration of resources for the aim of development would create environmental issues. A report by WCED (1987) revealed that in recent years, industrial countries have been able to achieve economic growth using less energy and raw materials per unit of output. This, along with the efforts to reduce the emission of pollutants, will help to contain the pressure on the biosphere. However, with the increase in population and rise in income, per capita consumption of energy and prices of materials going up in the developing countries are essential for the needs to be met. Greater attention to resource efficiency can moderate the increase, but, on balance,

environmental problems linked to resource use will intensify in global terms (Esty & Ivanova, 2003). As mentioned by Sheraz (2014), natural resources can contribute significantly to development in different ways, by generating an economic activity and as a source of growth; and as a livelihood, by providing much-needed jobs for people thereby reducing poverty and supporting the achievement of Millennium Development Goals (MDGs).

Environmental degradation issues (EDIs) and forest degradation issues usually occur due to development activities. Higher exploration would lead to negative impacts and effects toward surroundings. According to Churchill (2005), the history and culture of a people embody the effects of previous habitats and of their final environment; but this means something more than local geographic conditions. It involves influences emanating from far beyond the borders. No country, no continent, no sea, mountain, or river is restricted to itself in the influence which it either exercises or receives. Furthermore, the impacts and effects caused by EDI could affect quality of life as well. These statements are supported by Churchill (2005). Four fundamental classes of effects can be distinguished, namely the first class, which includes direct physical effects of the environment, similar to those exerted on plants and animals by their habitat. Certain geographic conditions, more conspicuously those of climate types, apply certain stimuli to which man, like the lower animals, responds by an adaptation of his organism to his environment. Many physiological peculiarities of man are due to physical effects of the environment, which doubtless operates very strongly in the earliest stages of human development, and in those shadowy ages contributed to the differentiation of races. The unity of the human species is as clearly established as the diversity of races and peoples, whose divergences must be interpreted chiefly as modifications in response to various habitats in extended periods of time. The second one more varied and important, are the psychical effects of geographic environment. As direct effects, they are doubtless bound up in many physiological modifications; and as influences of climate, they help differentiate peoples and races from the context of temperament.

Environmental Resource Development

Development is conceived as an economic growth and is a quantitative concept that basically means more of the same. Yet, even if it is limited to just the economic sphere, it is clear that economic development is more than just economic growth alone. Economic development refers to growth accompanied by qualitative changes in the structure of production

and employment, which is generally referred to as *structural change*. Of particular importance for developing economies is the increase in the share of the dynamic industrial sector for national output and employment, and a decrease of the share of agriculture. This implies that economic growth could take place without any economic development (Szirmai, 2005). In a study done by McGillivray (2008), it was shown that to be sustainable, economic growth must be constantly nourished by the fruits of human development, such as improvement in workers' knowledge and skills along with opportunities for their efficient use; more and better jobs; better conditions for new businesses to grow; and greater democracy at all levels of decision making. However, slow human development can put an end to fast economic growth. According to *Human Development Report 1996*, "during 1960–1992 not a single country succeeded in moving from lopsided development with slow human development and rapid growth to a virtuous circle in which human development and growth can become mutually reinforcing". Since slower human development has invariably been followed by slower economic growth, this growth pattern was labelled a "dead end."

Indicators of wealth, which reflect the quantity of resources available to a society, provide no information about the allocation of those resources; for instance, about more or less equitable distribution of income among social groups, about the shares of resources used to provide free health and education services, and about the effects of production and consumption on people's environment. Thus, it is no wonder that countries with similar average incomes can differ substantially when it comes to people's quality of life, access to education and health care, employment opportunities, availability of clean air and safe drinking water, the threat of crime, and so on (McGillivray, 2008). In terms of economic development, GDP growth may be of interest to policy makers for many reasons, but GDP can be a misleading indicator of national income (Winter-Nelson, 1995). The World Bank has long maintained that economic growth is good for both people and the environment. This type of "win-win" situation is based on the view that an immediate benefit of economic growth is a rise in per capita income, which can contribute to alleviate poverty and to clean up the environment (Vadlamannati & Pin, 2009).

Forest Resources Development

Nineteenth-century British colonial enterprise was a major catalyst for change in the relations between forests and people. It fractured the forest-dominated riverine infrastructure that influenced the relations between humans and

nature (Jeyamalar, 2005). Forests have played an important role in the resource-based socio-economic development of Malaysia (Oon et al., 2002). Under the Malaysian Constitution, forestry comes under the jurisdiction of the respective State Governments. As such, each State is empowered to enact laws on forestry and to formulate forestry policy independently. The executive authority of the Federal Government only extends to the provision of advice and technical assistance to the States, training, the conduct of research, and in the maintenance of experimental and demonstration stations (Penh, 2010).

Malaysia is one of the countries with high percentage of forested land among developing countries and the estimated forested land in Peninsular Malaysia (in 2010) was 5.86 million ha or 44.4% of the total land area. Besides, of the total forested land, 4.80 million ha had been designated as Permanent Reserved Forests (PRFs) under the National Forestry Act 1984. The PRFs are managed based on Sustainable Forest Management (SFM) principles and practices (Omar & Hamzah, 2012). According to the written report by Omar and Hamzah (2012), there are three major forest types in Malaysia, namely inland forest, peat swamp forest, and mangrove forest. These three categories of forests are then divided further into the different layer of forest, such as upper montane, lower montane, upper dipterocarp, hill dipterocarp, lowland dipterocarp, peat swamp, and mangroves (see Figure 2.2). The topography of the country ranges from moderate to steep slopes. In Peninsular Malaysia, the land consists of narrow east and west coastal plains with undulating foothills skirting a core of mountainous ranges. Each forest type is related to topography, altitude, and drainage, and they are very varied (Country Profile Malaysia Forestry, n.d.).

Human induced permanent conversion of forest land to non-forest is when part of the forest is cut and the land is cleared, and used for another purpose. Legally, forest refers to Permanent Reserved Forest or Permanent Forest Estate, Protected Area, or Totally Protected Areas (Forestry Department, 2014). Human population increase is considered to be the driving force behind deforestation (Clive, 1991). Temporary change in land use, like one rotation tree crop (up to 25 years) within forest reserves is not considered as deforestation (Omar, 2012). Besides, forest degradation, as mentioned by Omar (2012), is a direct, human-induced decline in forest canopy cover of up to 70% of the existing forest canopy cover, or at least 50% of existing forest carbon stocks. Deforestation and forest degradation in Malaysia is a complex phenomenon with varying causes. So far, however, the focus is largely on direct or proximate causes like industrial logging, large-scale commercial

oil palm plantations and agribusiness, road construction, and large dams. Far less attention is paid to the indirect or underlying causes and agents, inter-linking and working to enrich the very few, while creating hardships for many people as a result of degraded or diminished resources (Yong et al., 2014). For example, deforestation and development of agricultural fields increase provisional services, but reduce biodiversity and genetic resources (Fitzherbert et al., 2008).

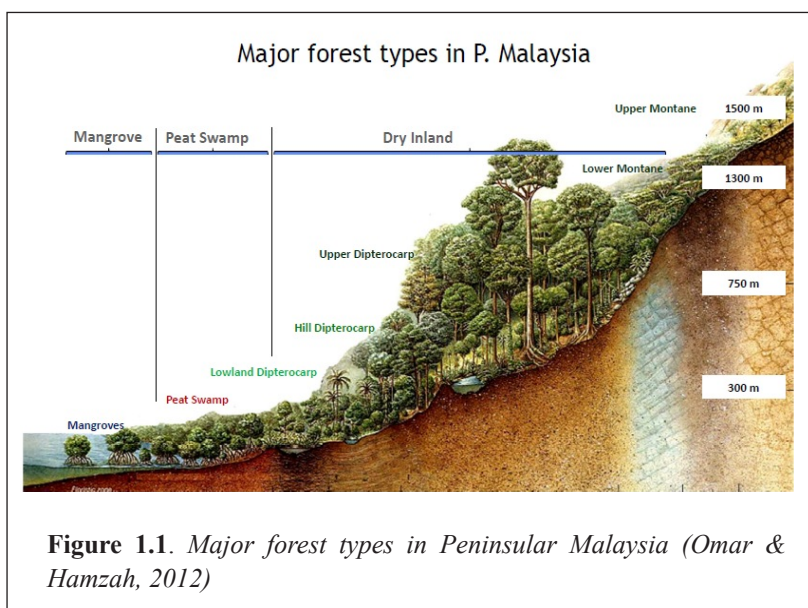


Figure 1.1. Major forest types in Peninsular Malaysia (Omar & Hamzah, 2012)

Natural management is considered a process by which a particular set of techniques become accepted, institutionalised, and stabilised (Majid-Cooke, 1995). Management intervention can only be taken if degradation is known ahead of time (Lewis et al., 2016). The rate of deforestation in Malaysia reached an average of 1.8% per year between 1981 and 1990, which was among the highest in the world (World Resource Institute, 1998). The main commercial crops grown in the clear-cut forests of Malaysia are oil palms (*Elaeis guineensis*) and rubber trees (*Hevea brasiliensis*), which make up approximately 28% of the total land use (Peh et al., 2005).

The National Forestry Policy 1978 and the National Forestry Act 1984 are currently being reviewed to incorporate the new emerging issues of forestry, such as strengthening forest governance, enforcement activities, climate change, habitat loss, and food security. The National Forestry Programmes are holistically planned and implemented to enhance forest

management practices, and sustain forest health and eco-system services. The programmes look into several aspects, namely forest resources management, environmental protection, and socio-economic benefits from the forest to achieve sustainable forest management (SFM). In addition, the State's land-use policy is also being reviewed to facilitate the additional development in forestry (Lucattelli et al., 2010). To make better land-use management and conservation decisions, it is essential to evaluate ecosystem services and to understand the mechanisms underlying their dynamic changes by incorporating both ecological and social factors into relevant analyses through interdisciplinary approaches (Sakai et al., 2016).

Expanding human populations and industrial drivers, such as logging, large-scale agriculture, and exotic-tree plantations, are major causes of forest loss and degradation (Laurance, 2007). Consideration of population size is particularly important in tropical forests where diversity of tree species is high, population densities are low, and many species are insect-pollinated, which may limit pollen flow to relatively short distances (Dick et al., 2008). Natural forests in the humid and sub-humid tropics are commonly managed under selection logging regimes (Putz et al., 2012). Increased inbreeding and loss of genetic diversity can have severe negative effects on populations, for instance, reducing growth, reproductive output, ability to resist pests and diseases, and capacity to adapt to environmental variation (Ellstrand & Elam, 1993; Hughes et al., 2008). The aim of the Selective Management System (SMS) of Malaysia is to ensure sufficient residual stock and advanced regeneration (Appanah, 1998), and enrichment planting is usually limited to cleared areas such as forest roads, logging tracks, and timber collection areas (Forestry Department of Peninsular Malaysia, *personal communication*). International criteria and indicators for sustainable forest management already require that forest managers take measures to conserve genetic diversity, but little guidance is available on how to integrate genetic conservation in the management of production forests (Jalonen et al., 2014).

Moreover, if sustainable forest management standards and systems will be effective in ensuring the sustainability of forest fuel production, several fundamental conditions must exist that allow for effective overall forest management. The institutional frameworks for effective enforcement of national and international laws must exist. Besides, there must be no illegal harvesting of forests; and tenure rights must be clear at the forest management level (Stupak Inge et al., 2011). Hoelvet and Muys (2004) analyzed 164 SFM standards from international processes and forest certification schemes which had been collected worldwide. They found that one cause of variation among

standards was geographical origin. Standards from developing countries had more emphasis on social and economic aspects of sustainability, while standards from industrialized countries emphasized ecological forest functions more strongly. Efficient forest management and efficient enforcement of legislative requirements are prerequisites for effective certification of sustainable forest management. Supporting measures for these two basic requirements includes monitoring and assessment, education, and research. Further support and synergy may be obtained if forest certification systems operate in parallel, or together with, relevant optional international agreements, policies, recommendations, and guidelines, and means of governance for other links in forest product supply chains (Stupak Inge et al., 2011). Sustainability is increasingly addressed at more integrated levels than the individual operator level: landscape level, supply chain level, and market and global levels. Bioenergy feedstock production is one of the factors that drive this development—large-scale problems such as greenhouse gas emissions, food security, indirect land-use changes, and competition between raw materials for different uses are major concerns.

Environmental Resources Development and Forest Resources Development

Efforts have been underway to strengthen the legislative framework through continuous review, updating, and amending where practical to meet future needs. In addition, Malaysia is developing expertise and tools such as environmental auditing and natural resources accounting to help quantify impacts on the cost of environmental regulation. In particular, a system of Natural Resource Accounting is being developed to illustrate the effects of economic development on the natural resource base and the refinement of economic indicators. Malaysia also uses five-year plans, which seek to implement strategies and programmes and allocate funds to realize the objectives and commitments of the National Development Policy. The results of the Rio process generally, and of Agenda 21 particularly, were incorporated and, where appropriate, integrated into the national planning process.

Overall, environmental and natural resource management is guided by long-term sustainability needs and improvement in the quality of life. The policy aims at promoting economic, social, and cultural progress through environmentally-sound and sustainable development. Emphasis is placed on addressing environmental and resource management issues in an integrated and holistic manner. Steps are taken to identify prudent, cost-effective, and

appropriate management approaches that yield multiple benefits in order to ensure that development is sustainable and resilient. Steps also were taken to strengthen the database for environmental decision-making by introducing the use of sustainable development indicators. This system includes natural resource accounting, environmental auditing, and environmental costing. Efforts are directed at collecting data in an integrated manner to facilitate analysis on the sustainability of a sector or state. These indicators of sustainability enable the Malaysian government to ascertain the impact various sectors have on the environment, making it easier to plan remedial land use, since planning will be strengthened as regulations are introduced to control access to biological resources, as well to address biosafety issues, such as those relating to genetically modified organisms. A specific example is the overall management of marine affairs, which is reviewed to address multiple-use conflicts in marine areas, alleviate pressure on the marine environment, and thus enhance marine and coastal biological diversity.

The tropical rain forests of Malaysia are extremely complex ecosystems and are richer in tree species than in similar areas of Africa and South America. They are, in fact, the most species rich plant communities known anywhere in the world (Whitmore 1975) and have evolved over millions of years. There are at least 15,000 species of flowering plants, of which 2,500 are tree species; 286 species of mammals; 600 species of birds; 140 species of snakes; 150 species of frogs and thousands of species of insects, many of which are still being documented. In addition, over 1,300 plant species have been identified as having potential pharmaceutical properties with some of them currently being used as traditional herbal medicine (Thang, H.C. 2009). In Peninsular Malaysia is estimated to contain 8,000 flowering plants, a total 2,650 species are tree species with 890 of them reaching harvestable sizes of at least 45cm dbh (Mohd Yunus, 1993; Primack and Lovejoy, 1995 and Anon, 1996). The shrub stratum and ground layer contain not less than 1,300 species of herbs and 70 species of ferns identified to have medicinal values (Mohd Hizamri, 1993).

Funds for programmes and projects to promote environmental protection initiatives and cleaner technologies are mainly from the Malaysia government's annual budget. In addition, donor agencies provide funding for specific programmes related to pollution control and other environmental activities. Malaysia participates actively with regional and international organisations to support environmental protection programmes and demonstration projects to highlight the application of technology transfer. The Department of Environment participates in bilateral and regional programmes to address environmental issues of mutual concern.

CONCLUSION

Forest area in Malaysia has changed every year caused by the development activities. According to Yong et.al (2014), the focus is largely on direct or proximate causes like industrial logging, large-scale commercial oil palm plantations and agribusiness, road construction and large dams. Far less attention is paid to the indirect or underlying causes and agents, inter-linking and working to enrich the very few while creating hardships for many people as a result of degraded or diminished resources. Besides agriculture activities, the explored of forest involved a many of development planned, it was such as for tin-mining, housing, industrial areas, new area of development, and some of the production likes logs, sawn timber, plywood and mouldings like said by Fitzherbert et al. (2008), deforestation and development of agricultural fields increase provisional survives, but reduce biodiversity and genetic resources. Forest management has been defined as dealing with the overall administrative, economic, legal, social, technical, and scientific aspects involved with the handling of conservation and use of forests. It implies various degrees of deliberate human interventions, ranging from action aimed at safeguarding and maintaining the forest ecosystem and its functions, to favouring given socially or economically valuable species or groups of species for the improved production of goods and environmental services.

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