

## GUEST EDITORIAL

### RUBBER AND RUBBERWOOD DEVELOPMENT: RETROSPECTIVE AND FUTURE TRENDS

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Forestry is essential to the economies of many developing nations. However, this sector faces increasing social and economic pressures due to an increasing demand for products such as food, fodder, energy, wood and non-wood forest products. As a consequence, considerable areas of forest land have been converted into agriculture and other forms of land use. In many countries, log production from natural forests is declining and will likely continue to do so in the future. In the case of Malaysia, over the last two decades, production of round wood from natural forests has reduced from 41 to 21 million m<sup>3</sup>. It is anticipated that the supply of logs will gradually decline and eventually stabilise at around 18 million m<sup>3</sup> year<sup>-1</sup>. This log production falls short of the capacity of primary processing timber industries in the country. The shortfall will need to be met by promoting sustainable use of existing woody material. One solution is to utilise readily available cellulosic biomass resources from agricultural tree crops as they not only provide sources of wood products, but also produce other benefits that support basic human needs and economic development.

Throughout the Asia Pacific region, there has been a dramatic increase in the establishment of agricultural tree crops (i.e. fruit orchards, rubber, oil palm and coconut plantations). Agricultural statistics reported that since the early 1960s, the area of agricultural tree crops in the region has tripled from about 12 to 35 million ha. Although this increase represents a potentially large supply of woody material, it is not currently utilised as such to any major extent, except in the cases of rubberwood in Malaysia and Thailand, and cocowood in India, Sri Lanka and the Philippines. In some countries including Malaysia, rubber tree crops are more economically important than other agricultural

tree crops and industrial forest plantations, not only in terms of producing natural rubber but also in contributing to the country's overall round wood supply. Rubber plantations in Malaysia presently contribute almost 20% of the world's natural rubber. In the last decade, Malaysia exported about USD683 million worth of rubberwood furniture, accounting for 70% of the country's furniture export.

However, lack of accurate information regarding the extent and potential availability of tree crops for wood supply has led to an incomplete analysis of forest and non-forest supply and demand situations in many developing countries. This could be because government agencies are often under-funded, thus data on tree crop resource monitoring tend to be sporadic. As reported by the Malaysian Rubber Board (MRB), at the beginning of the decade, Malaysia had about 1.84 million ha of rubber plantations compared with 1.43 million ha in 2000 and 1.04 million ha in 2012, i.e. a reduction of 22 and 27% respectively.

Historically, during the 19<sup>th</sup> century, Brazil was the main supplier of rubber latex, which was collected through tapping trees in the natural forest. In 1876, Sir Henry Wickham covertly brought rubber seeds from Brazil to Kew Gardens in the United Kingdom. The seedlings were then shipped to Sri Lanka and some surviving plants were transferred to the Singapore Botanical Gardens, from which 22 seedlings were transported to Kuala Kangsar in Peninsular Malaysia.

The genus *Hevea* of rubber trees, belonging to the family Euphorbiaceae, is indigenous to tropical South America and consists of 10 species that produce latex. Rubberwood is the standard Malaysian name for the timber of *Hevea brasiliensis* (Wild. ex A.D.R. de Juss.) Muell

Arg. Only *H. brasiliensis* produces latex that is of sufficient quantity and quality for rubber. These trees formed the basis for research at the Rubber Research Institute of Malaysia (RRIM), presently known as MRB. Breeding programme at the Institute started in 1928. The initial plantings were used as stock materials for rubber plantations in the country. In the 1980s, clonal stocks from the initial plantings were widened. Over time, the breeding programme at MRB produced better clones with higher latex yield. So far, the Institute has produced six series of RRIM clones, the most recent, new clones with the potential of producing high latex and timber known as Latex Timber Clone (LTC). There are more than 20 clones planted throughout Malaysia today.

Research on the utilisation of rubberwood started in the 1950s. Early studies focused on natural properties of rubberwood but the results did not arouse the interest of the industry. However, in the 1970s, increasing shortage of traditional timber species changed this and research on rubberwood became active. Since then, research has contributed significantly towards the success of processing rubberwood. In 1978, the Rubberwood Research and Utilisation Committee was established to coordinate and intensify rubber and rubberwood research at the national level. The committee comprised members from the MRB, the Forest Research Institute of Malaysia (FRIM), the Standards and Industrial Research Institute of Malaysia (SIRIM), the Malaysian Timber Industrial Board (MTIB), and later, the Malaysian Industrial Development Authority (MIDA), Universiti Putra Malaysia (UPM) and the Malaysian Rubber Producer Council. A comprehensive research programme was formulated and researchers mainly from FRIM and MRB were mobilised to conduct research and development in various areas such as rubber clonal upgrading and rubberwood utilisation.

The two main types of rubberwood utilised by the rubberwood-based industries in Malaysia are chiplogs and sawlogs. Chiplogs are used by panel products industries, e.g. particleboard, cementboard, medium-density fibreboard and chipboard industries while sawlogs, by sawmillers and plywood/veneer operators. Data for Peninsular Malaysia revealed that significant shortfalls in the supply of rubberwood sawlogs and chiplogs occurred in 2002–2006 and again

in 2010 onwards. Reduced supply of raw material translated into higher prices paid to rubber small landholders in close proximity to processing centres.

A time series of satellite imageries are useful in providing information on change in area of rubber plantation. It has been reported that annual gross reduction of rubber plantation in Selangor from 1989 till 1999 was 7.6%. Relatively poor price of natural rubber was one of the primary drivers that determined the formation and implementation of rubber policy instruments, i.e. crop diversification, replanting grants and trade planting, which affected subsequent change in rubber acreage. In addition, federal government policies operating within the state were explanatory factors for rapid urbanisation and development of infrastructures in the state. These activities, driven by demographic expansion, subsequently determined the reduction in rubber acreage.

The available rubberwood log supply in Malaysia was not able to meet market demand. This decline in supply of rubberwood occurred despite the Malaysian government's awareness of the socio-economic and environmental importance of rubber and rubberwood. However, this downturn can be overcome with improvement in utilisation and product diversification. In this respect, the recent development of LTC holds great promise for adequate supply of rubberwood.

Given the importance of rubber tree crops in the socio-economy of the community, conflict over the change and use of resources is likely to grow in the future. Hence, the challenge facing the Malaysian government is to provide a stable area in which locally relevant decision-making can occur. Despite the implementation of various rubber and rubberwood policies to guide future development, reversal in the historical decline of rubber in this area has yet to happen. If this region is to move towards sustaining vegetated land cover in the future, broad agreements need to be reached among stakeholders in the industry, the government and the broader community as to what constitutes an acceptable level of landuse/cover conversion or, if the revision of landuse policy is indeed required.

The speed at which rubberwood has been established as an important wood product in the international market is remarkable. Significant progress has been made in selecting rubber

planting materials for wood production. The Malaysian government has confirmed rubber as a strategic commodity. Therefore, the main agencies responsible for coordinating small landholder activities should develop strong policies in support of the maintenance of rubber plantation. With increasing demand for rubberwood, the outlook for rubber plantation as a source of timber is favourable. Due to shrinking area of natural forest and environmental conditions in its management, the future trend in global wood production will be towards output

from planted trees rather than managed natural forests.

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