

# Potential Agricultural Applications of Microsatellites for Malaysian Agriculture

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Malaysia is 330,803 km<sup>2</sup> and located in Southeast Asia. It comprises two major land masses, that is Peninsular Malaysia and the states of Sabah/Sarawak in the island of Borneo. The South China Sea separates these two land masses. Flying distances between Kuala Lumpur, the capital city located in Peninsular Malaysia to Kota Kinabalu, the capital of Sabah and to Kuching, the capital of Sarawak are 2 hrs 30 minutes and 1 hr 45 minutes respectively. As can be seen this is a fairly wide coverage for which imaging from space is necessary to support viability of agriculture, fisheries, environment, meteorology, natural disasters and so on. Malaysia's early imaging from space satellites used the Tiungsat and Razaksat satellites respectively. Valuable lessons were learnt which clearly demonstrated the need for future image data from space.

With current developments, the idea of using microsatellites as platforms for image acquisitions becomes very attractive as a practical and low cost approach is made available. Though there are a multitude of applications possible with data acquired by microsatellites, this presentation will focus on agriculture applications. Malaysia has 5 million ha of land under oil palm cultivation. Oil palm is an important food for most of the world, it is the most versatile and efficient vegetable oil in the world, yielding more per hectare than any other edible vegetable oil crop. Currently environmental and nature groups based in Europe have been critical about oil palm cultivation in Malaysia and Indonesia. However, oil palm is cultivated in a systematic and regulatory manner in Malaysia, with 50% of the country still remaining intact as forest. Use of microsatellite data will ensure efficient and effective monitoring of these forest areas from illegal land clearance, illegal logging and other activities detrimental to the environment. Up to date information on land use for oil palm and forestry can be obtained at very frequent temporal intervals to counter any criticisms or concerns on oil palm cultivation in Malaysia.

Use of such imagery will also help in the precision agriculture applications particularly on using variable rate applications in the oil palm plantations and in paddy farming particularly, with potential applications for example for rubber cultivation, cocoa and pineapples. Apart from fertilizer applications, crop growth monitoring, surveillance against pests and diseases and harvesting are further applications of the imaging technologies. Based on these requirements, the critical bands, its spectral and spatial resolutions identified through local research will be used in the collaborative development of sensors in the satellite building program. Such positive and synergistic efforts will lead to appropriate images being acquired for the needs being addressed.

As crops planted in Malaysia have commonality with crops in Southeast Asia, primarily with Indonesia, Thailand, Philippines, Vietnam and Cambodia, collaborative efforts can be made to share and exchange vital information on the related crops. Thus the microsatellites will not only help to acquire data, but will help bring these neighboring nations closer together.