

Case Study for Monetary Assessment of Flood Control and Sediment Control function of Paddy Fields in
Muda Irrigation Scheme, Malaysia.

By

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Abstract

Paddy cultivation suits to rainy climate of Asia Monsoon region and is sustainable agricultural system free from salt accumulation and injury by continuous cropping over thousand years. It has been widely perceived that large scale paddy planting in Asian countries are contributing to degradation of the environment mainly through destruction of ecosystem and methane gas emission. Fundamental question in the agricultural function is how to meet the growing demand for food and environmental protection. Paddy fields serve as artificial wetland which has multi-functionality such as flood control, sediment control, and ground water recharge and ecosystem preservation and provides a broad range of benefits in the social, cultural and environmental aspects to the region.

This study investigates the potentials of flood and sediment control in a specific study site in Malaysia. The case study was conducted in the Muda Irrigation Scheme, the largest rice production scheme in Malaysia. Study area covers approximately 25km², located in floodplain areas are intelligently used for flood control and sediment control. Through computer modeling, the behavior and response of flood water within paddy fields located in floodplains were captured. Physical structures of paddy fields greatly increase the capacity for flow retention and sediment deposition. It was therefore scientifically proven that paddy fields help to preserve natural floodplain terrain to attenuate flood. Subsequently, these important findings were translated into monetary value for appreciation of wider audience. Cost replacement method was used to equate the flood control and sediment control value of paddy field to equivalent flood prevention dam and river de-silting projects. Next a national projection was provided. It was found that the values of flood and sediment control were conservatively estimated to be 440mil USD and 12mil USD respectively. This is almost as significant as the commodity yield (rice production) of about 472mil USD annually. The study thus successfully proved the worth of multi-functionality of paddy fields.

Keywords: multifunctional; paddy fields; Muda Irrigation Scheme; flood control function; sediment control function; monetary assessment of the function; Cost replacement method.

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