INTEGRATION AND APPLICATION OF FLUVIAL-12 AND ARCVIEW GIS FOR FLOOD RISK ANALYSIS

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ABSTRACT

Geographic Information System (GIS) is an efficient and interactive spatial decision support tool for flood risk analysis. This research describes the ability of ArcView GIS tool to integrate the FLUVIAL-12 hydraulic model within GIS environment. Water surface profiles generated from FLUVIAL-12 are analysed in ArcView GIS to produce flood risk maps for Pari River. The users-friendly menu in the ArcView GIS to enable the users to create, analyse and visualise the flood risk maps, base on the output data from FLUVIAL-12 hydraulic model. The flood risk model is tested using the hydraulic and hydrological data from the Pari River catchment area. The required sediment input parameters spatial data were obtained from Sinnakaudan (2003). The results of this study prove that GIS provides an effective environment for flood risk analysis and mapping.

CHAPTER 1
INTRODUCTION

1.1 Background

In recent years, severe flooding has occurred in several parts of Malaysia, both as localized flash floods and as basin-wide floods on major river systems. Some of the badly affected areas are situated at the river basins in Penang (Juru River Basin), Pahang (Pahang River Basin), Terengganu (Setiu River Basin) and Perak (Kinta River Basin) (Sinnakaudan *et al.*, 2001). The flood prone areas are still under heavy development because there are no sustainable guidelines for the development on the flood plains (Sinnakaudan, 2003).

By their nature, floods are generated by the random coincidence of several meteorological factors but man's use of the river catchment also has an impact upon the severity and consequences of the events (Sinnakaudan, 2003).

There are few attempts in Malaysia to provide accurate flood risk maps taking into account of sediment movement along the river channel. Abu Hasan (1998) and Ab. Ghani *et. al* (1998; 1999) had attempted to quantify the effects of sediment movement and corresponding cross-sectional changes in producing the flood levels (Sinnakaudan, 2003). Successful applications of several sediment transport models such as HEC-6 and FLUVIAL-12 indicate the possibility of extending the obtained results in mapping the flood prone areas by incorporating sediment transport bearing, in mind the physical