

Flood Damage Assessment: A Review of Flood Stage–Damage Function Curve

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Abstract Nowadays, flood control has been replaced by flood management concept in terms of living with flood, making benefit of it, and minimizing its losses. The success in flood management in any region depends on the evaluation of different types of flood losses. For the assessment of flood damages, this requires the use of stage–damage functions for different categories of land use. A review is presented of the methods used to construct stage–damage function curves for residential, commercial, agricultural, and industrial category. Two main approaches in constructing stage–damage functions are empirical approach, which is based on damage data of past floods, and synthetic approach, which uses damage data collected by interview survey or questionnaire. For a developing country like Malaysia which has limited history and actual flood damage data, the synthetic method is the preferred approach in constructing stage–damage function curve.

Keywords Flood management • Flood damage assessment • Stage–damage function • Land use • Synthetic approach

1 Introduction

Flood damage estimation is an essential element in water resources planning, mainly for the purpose of flood mitigation benefits' evaluation [1]. In conventional practice, the flood management approaches focus on the design standards and structural flood mitigation measures [2]. Normally, flood mitigation structures were designed in order to control up to a certain, predefined design flood, i.e. return period of the design rainfall. In recent years, this structural flood control approach has been changed to a new developed concept which is referred to as “flood risk management” [2]. The degree of protection is determined by broader

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