

Investigating Factors Affecting Flood Vulnerability and Risk Management in Ahvaz City Using a Futures Studies Approach

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Abstract

INTRODUCTION: Urban flooding is one of the major hazards threatening cities, and its impacts in Ahvaz are influenced by environmental, physical, infrastructural, social, and managerial factors. This study aimed to analyze the interrelationships among variables associated with flood impacts and losses and to identify and prioritize flood risk management strategies in Ahvaz using a futures studies approach.

METHODS: This applied study employed a mixed-method sequential exploratory design. Data were collected through documentary studies, semi-structured interviews, and consultation with 50 purposively selected experts. Twenty-eight variables were analyzed using a 28×28 structural cross-impact matrix in MICMAC software, and 26 structural and non-structural strategies were evaluated through three Delphi rounds.

FINDINGS: The matrix filling rate was 95.92%. Among the groups, economic–physical variables had the highest total influence (577), followed by environmental (211) and social variables (200). “Destruction of the urban wastewater system” (44), and “destruction of urban housing” and “damage to clinics and health centers” (42 each) were among the variables with higher influence. In the Delphi process, “cleaning and dredging the Karun River channel” (4.94), “improvement of the wastewater network and runoff collection system” (4.91), and “removal of Karun River meanders and creation of a suitable alignment” (4.87) received the highest mean scores.

CONCLUSION: Flood impacts in Ahvaz are interconnected and require an integrated and preventive management approach. Improvement of wastewater and runoff infrastructure, scientific management of the Karun River, control of development in high-risk areas, and strengthening institutional coordination and social capacities should be addressed simultaneously.

Keywords: Urban flooding, vulnerability, MICMAC, risk management, futures studies, Ahvaz.

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Introduction

Floods are among the most frequent and destructive natural hazards worldwide and remain a serious and persistent threat to human settlements, critical urban infrastructure, and the economic and social assets of communities (1). The devastating impacts of floods extend beyond material and financial losses

and include fatalities, widespread displacement, disruption of public services, and psychological distress. According to United Nations reports, between 1998 and 2017, more than 2.3 billion people worldwide were directly or indirectly affected by flood events, while the associated economic losses reached approximately USD 662 billion.

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