

賽局理論運用於災害防救體系研究之可行性  
A Feasibility Study of Applying Game Theory on Disaster Management  
System

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中文摘要

災害防救體系的研究多著重於組織建構與任務分配的規劃,較缺乏組織互動模式與機制的探討。而探討組織的水平與垂直互動關係為府際關係研究的重點,其運作意涵包括市場、結盟與賽局等概念。本文目的在於以理念與文獻面向,討論賽局理論運用於災害防救體系研究之可行性與限制。首要闡述賽局與災害的理念內涵,以界定兩者之間的關係;其次針對相關文獻進行評述,包括研究主題、領域與方法等。最後探討理念面與文獻面的可行性分析,並提出其運用上的限制。賽局理論為理性選擇模式,適用於包括府際關係在內之互動分析;而災害具有演化與複雜等特性,使得災害的處理需要整合體系內部成員,以減少衝突,達到最大效用。分析結果顯示賽局理論與災害防救體系兩者之間在「管理」與「政治」學科領域有交集,若欲進行相關的研究,先設定某一賽局模型作為研究基礎,利用文獻回顧、問卷訪談等方法進行災害防救決策過程個案的重建,並進行比較分析。在體系內部多方互動的情況下,「多人非零和賽局」應為可選擇的模型。但由於賽局理論偏重於決策者效用的極大化,為使體系運作能顧及群體的利益,運用賽局理論研究災害防救體系的前提,是須設定酬償值與效用形式,以求合適的偏好量化;以及因各部門層級節制關係的差異,須先選定適當研究對象與災害防救的階段。

關鍵字：災害防救體系; 賽局理論; 多人非零和賽局

## Abstract

The research of Disaster Management System tends to focus on the planning of organization construction and tasks allocation, while there leaves a deficiency in the exploration of organization interactive model and mechanism. The probe into the horizontal and vertical interaction of organization constitutes the chief concern of the study on Intergovernmental Relations, which involves the concepts of markets, coalitions and games for operation. This article aims to discuss from both theory and literature the feasibility and limitations of applying game theory to the study of Disaster Management System. This article begins with the elaboration of the concepts and content of games and disaster in order to define the relationships between them. It then provides comments on related literature, including the theme, field and method of research. Finally, the researcher explores the feasibility analysis from theory and literature, and also offers the limitations of its application. The game theory with its rational choice model can be applied to interactive analysis, including Intergovernmental Relations. The evolutionary and complex features of disasters make it necessary to integrate the members within the system when dealing with disaster in order to decrease conflicts as well as to produce the maximal utility. The results of analysis indicate that game theory and Disaster Management System have something in common on the disciplines of management and politics. If we intend to conduct related research, we have to first of all choose a game model as the basis of research. Then we should reconstruct the cases of decision-making process of disaster management through literature review and questionnaire interview, and do comparative analysis. Under the multiple interaction inside the system, N-person Non-Zero-Sum Game could be the available model. Nevertheless, game theory lays emphasis on maximizing the utility of decision-makers. In order to make the system operate without sacrificing the group profits, the prerequisite of applying game theory into the research of disaster management system is setting the mode of pay-off and utility. In this way, preferred quantification can be obtained properly. Furthermore, due to the discrepancy of hierarchical relationships between different departments, we have to first decide the appropriate subjects and stages of disaster management.

Keyword : Disaster management system; Game theory; N-person non-zero-sum game