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Relationship between Resilience and DISASTER Recovery

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Abstract

The purpose of this study is to provide the theoretical background of resilience and the theoretical foundation of the indexes for the factors affecting the resilience of applying the disaster stage and disaster recovery process. Designing an index of community resilience can be important basic materials for policymakers to determine policy priorities in terms of disaster-related policy development and geographical characteristics, as well as resilience levels. In the future, it will be possible to provide empirical evidence that policy suggestions can be made by deriving key factors affecting resilience and comparing trends.

[Keywords] *Disaster, Recovery, Resilience, Disaster Management, Community Disaster Resilience*

1. Introduction

It is becoming increasingly difficult for modern societies to predict risks and to deal with predictions of risks as they are difficult to predict and qualitatively with new risks, uncertainties and social vulnerabilities (Beck, 1997), and the interconnections between various international crises, which have been difficult to find before, have been strengthened, and they have developed into a dynamic and complex pattern, so that countermeasures are vague and there are limitations on the countermeasure resources.

In particular, if the prediction of the oncoming crisis is difficult and if the countermeasures against the crisis are also unknown, it is concluded that the recovery strategy is more effective than the preventive strategy[1]. It is necessary to consider the regional competence in a comprehensive way including the physical factors as well as the socioeconomic factors[2], and as the awareness of the crisis as a dynamic property within the social ecosystem is expanded, the concept of resilience is receiving attention.

Resilience is used with the meaning of restoring force and elasticity in terms of environment, ecology, engineering and sociology[3]. However, since there is no agreed term yet, this discussion refers to it as resilience, taking into account the characteristics of the disaster recovery phase.

This discussion began with questions about how resilience affects the recovery of disasters. The risk of a disaster depends on the resilience of the incident and the adaptive resilience after the impact of the incident, based on the resilience and inherent vulnerability of the space surrounding the social institutional environment and the system and phenomena of the natural world[4]. This study investigates the main factors of resilience related to disaster recovery in case of actual disaster, as a process for analyzing how resilience can be measured, and prepare the theoretical background of resilience, its application to disasters, and the theoretical foundation of the indexes that affect the resilience of the disaster recovery process.

2. Theoretical Background

2.1. Concept of resilience

Resilience is a concept first used in psychology and health science rather than in disaster areas, and it means absorbing when external shocks are given to a system, or recovering how quickly system changes due to shocks return to their previous normal state.

Cutter et al. (2008)[2] reported that the system includes the ability to cope with disasters, restore the system to its original condition, and follow-up processes to learn disaster countermeasures, as well as normal conditions. Kim et al. (2010)[3] defined urban physical and social factors as the ability to respond quickly to disasters and recover to a better state.

Investments to maintain and improve health in both human health and community resilience reduce the need for expensive treatment and recovery. Everyone knows that prevention is a cheaper way to treat after the onset of the disease. Investing in community resilience before such a disaster can help reduce monumental recovery and subsequent costs after a disaster. Avoiding destruction is easier than restoring a destroyed community, and it receives less trauma in the long run. These analogies can be extended to the idea that healthy communities can prepare, absorb, and recover from disasters, just as a healthy body can resist disease.

2.2. Resilience in the disaster recovery phase

Disaster recovery is an activity to recover from a disaster immediately after the disaster to the original state before the disaster. Specific activities belonging to the recovery phase include a survival support system, and the activities of the preparation and response stages may be different for each type of disaster, but the recovery process is considered to be the same. Therefore, recovery strategy requires individual leadership and ability to act, utilization of local government's available resources, financial support between central government and local governments, and support for disaster management activists and volunteers to recover.

Traditionally, restoration has been thought in terms of short-term and long-term measures. In the short term, it is classified as relief and rehabilitation, and in the long term, reconstruction. Although recovery is a distinct step in the life cycle of disaster management that is clearly distinct, it is affected by actions taken during prevention and mitigation, preparedness, and response steps. Therefore, the more the community is prepared for disaster, the more effort is put into mitigating disaster damage, the shorter the recovery period, and the less resources and effort to restore[5].

In general, disaster management is divided into stages such as prevention, preparation, response, and recovery. In addition, resilience is high when resilience of community disaster system is high, when resilience components (5Rs) such as durability, extravagance, rapidity, resource dependence, and adaptability are well established. After the occurrence of a disaster, the resilience may vary depending on the extent of response, recovery and post-recovery effort. The difference depends on how well the system has worked well, and the effort in the recovery phase can also have a significant effect on improving resilience[6]. On the other hand, adaptability can have a significant impact on the recovery phase or post recovery phase.

3. Framework of Resilience

Using the proposed model of Cutter et al. (2008)[2] to improve the disadvantages of existing vulnerability and resilience models and to provide a conceptual basis for establishing baselines for resilience measurements, it is possible to explain the effect of resilience on the long-term disaster recovery process.

The starting point of this model begins with a precondition for each place that occurs within and between social, natural and environmental systems. Prerequisites include both inherent vulnerability and intrinsic resilience. The extrinsic factors (environmental, social system and nature) and intrinsic factors (vulnerability and resilience) are presented separately at the regional level, and the extrinsic factors affect the intrinsic factors, but

their effects cannot be measured directly. It shows that resilience and vulnerability are not conflicting concepts, but overlap each other and not entirely mutually exclusive.

Vulnerability is a concept that emphasizes both the pre-event aspect considering susceptibility to disasters and the post-event aspect considering responsiveness. Thus vulnerability better matches the pre-event and post-event resilience concept of disaster. In particular, the sensitivity highlighted by vulnerability is closely related to hazard mitigation [7][8]. And responsiveness depends on post-event recovery, vulnerability consider hazard mitigation activity at the stage immediately before the impact and at the stage immediately after the impact. Adaptive capacity or adaptability is generally a sub-variable of vulnerability, acknowledging the inevitability of change and adapting through learning and self-organization to adapt to changed conditions [9]. However, more specifically, proactive adaptability and reactive adaptability can be categorized, and to effectively implement the resilience of local communities, it is necessary to consider the differences between them.

4. Conclusion and Suggestions for Future Research

To manage the basic dynamics that are resistant to disasters and to identify the factors that improve them, it is necessary to identify not only the conditions under which they are measured but also factors that adversely affect resilience and factors that inhibit effective responses [10]. The transition from conceptual framework to evaluation is challenged by the multifaceted nature of resilience, including physical, social, institutional, economic and ecological dimensions.

Communities are regarded as the entirety within which the social systems interact within a given geographic space. There are many different communities within a geographically defined space, and subgroups actually have various vulnerabilities and resiliences that can lead to an imbalance of recovery in disaster recovery. Therefore, the model for describing resilience should be designed

to capture such gaps by focusing on social systems, environmental conditions, and place and spatial interactions between natural systems.

Indeed, various factors that constitute disaster systems in the community should have high resilience. Therefore, designing the index of disaster resilience in the community can be an important basis for policy makers to decide policy priorities considering disaster-related policy development and regional characteristics as well as resilience level. Resilience indexes are generally the results of activities to promote resilience rather than the behaviors or activities that occur in the community. In the future, it will be possible to provide empirical evidence that policy suggestions can be made by drawing out key factors that affect resilience and comparing trends.

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