

論文の内容の要旨

論文題目

Resettlement Planning in Infrastructure Projects Using Argument Mapping and
Qualitative Probabilistic Networks:

A Case Study of Padma Multipurpose Bridge Project.

(社会基盤開発事業に伴う住民移転計画における議論マッピングと質的確率ネットワークの応用：パドマ多目的橋建設事業を事例に)

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This thesis describes an alternative methodology for representing and analyzing diversified views of project Affected Persons (APs) in order to facilitate development processes including Land Acquisition Plans (LAP), Resettlement Action Plans (RAP) and Environmental Management Plans (EMP). The traditional methodologies including Spatial Decision Support Systems (SDSS) and Argumentation Support Systems have at times proven ineffective in terms of gathering, analyzing and incorporating diversified views of project APs into necessary strategies and actions. This ineffectiveness is due to the fact that they have limitations in dealing with ill-structured problems and uncertainty to analyze alternative strategies or management options. The thesis therefore proposes an integrated method in order to encounter these limitations.

The integrated method is based on a combination of Argumentative Mapping for Resettlement Planning (AMRP) and Qualitative Probabilistic Networks (QPNs). AMRP builds on existing proprietary mapping systems, which visualize the content and structure of diversified views of APs both geographically and argumentatively. Furthermore, AMRP facilitates developing QPNs at different phases of data collections and represents context specific issues derived from QPN. QPN is based on cognitive mapping technique, which aggregates diversified views or concepts of APs by developing causal relationships among concepts with qualitative probabilities.

The new methodology has been introduced in a large-scale infrastructure project, namely Padma Multipurpose Bridge Project, Bangladesh to verify its applicability. The project will require 918.45 hectares of land for permanent acquisition and temporary requisition. About 20000 people need to be displaced from their own households and commercial business enterprise structures due to this acquisition and requisition of land.

Initially, diversified views of APs were gathered at an individual household level and then aggregated QPN was constructed. The aggregated QPN has been then validated structurally and qualitative probabilities for individual relationships have been incorporated into the network at the group level. After that the final QPN was constructed.

Scenario-base analyses for different combination of management options/interventions have been conducted which provide recommendations such as: ward-by-ward based resettlement sites will ensure a higher probability of no joblessness, no homelessness and better living environment in the resettlement site than union-based resettlement sites; the government-registered rate for land compensation will provide a higher probability of joblessness than the current market rate; if the APs are not allowed to reuse the materials of structures, then this will lead to a higher probability of homelessness than not.

Results derived from the scenario-base analyses not only provide better insight of the land acquisition and resettlement-related problems, but also indicate critical management options for achieving their objectives. In this respect, the main findings include: that allowing APs to reuse the material of structures is the critical factor for ensuring adequate reconstruction activities; a separate resettlement site of non-permanent residents is the critical factor for better living environment in the resettlement site of the East bank. In addition, the analyses have established some relationships in the QPN that vary with different locations. For example, in case of a mixed resettlement, both non-permanent and permanent residents will end up being allocated with smaller plot sizes than in case of a separate resettlement site. This state will be more likely to happen in the East bank than in the West Bank. Moreover, in case of a mixed resettlement site, social conflict will occur more likely than in case of a separate resettlement site. This state will be also more likely to happen in the East bank than in the West Bank. For another issues, a particular social group of APs, namely woman-headed households, have exhibited a preference for different arrangements than other groups of APs. From the viewpoint of woman-headed households, the effectiveness of compensation distribution will be more likely if the implementing agency is responsible for distributing compensation. However, from the majority viewpoint of other

APs, The procedure for the distribution of compensation will be more effective if the local bank is responsible for distributing compensation to the APs.

Possible subjects for future research are twofold. First, the process of developing a QPN for AMRP could be automated in order to reduce processing time. Second, a longitudinal study could be carried out in order to evaluate the impact of the recommendations at the implementation and post implementation stage.