

交通建設生態補償機制選擇之研究

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摘要

Transportation construction is the basis for our infrastructure. It not only improves the traveling convenience, but also revives the economic growth among various regions. However, according to different studies, the total area of roads and their shoulders only occupies about 1% to 2% of the total land area of a nation, but their ecological impact covers about 10% to 20% of the total area. Taiwan, because of its particular geographical position and specific landscape, has been rich in its diversity of species. The Portuguese praised Taiwan as "Formosa". However, in the past years, our nation has paid more attention to its development and neglected to protect the environment. This has caused irreversible damage to the environment. Fortunately, in recent years, under the promotion of experts and scholars, the "ecological compensation system" has been introduced to Taiwan.

"Ecological compensation" is based on the three mechanisms, "Avoid", "Mitigation", and "Compensation" to reduce the impact of infrastructure construction on the ecological environment. The Environmental Protection Agency of the United States of America has proposed that the environmental impact assessment has to be used to assess each of the mechanisms. The environmental impact assessment is a special law in Taiwan. It has a high degree of enforcement and veto power, but its execution is very time-consuming and of no fixed evaluation criteria. If the proposed construction is rejected after the assessment, a newly proposed construction has to be assessed again. Thus, it will take too much time in doing the environmental impact assessment and the construction development will be delayed. This study first, through literature review, formulates an initial evaluation framework for transportation infrastructure construction. Then, the Fuzzy Delphi Method (FDM) is used to establish the final evaluation framework which has four major issues with a total of 16

factors. Furthermore, the Fuzzy Analytic Hierarchical process (FAHP) is used to determine the weighted value for each factor in order to establish an ecological compensation assessment table. The obtained scores presented in the table can demonstrate the seriousness of the ecological damage caused by the transportation construction. Finally, through expert interviews and using the Delphi Method, the criteria for choosing one of the three ecological compensation mechanisms is established. The table and criteria can help a planner assess the feasibility of a transportation infrastructure construction before the environmental impact assessment.

關鍵字：Ecological compensation, transportation construction, environmental impact assessment, FDM, FAHP