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Study on Effectiveness of Strategies to Re-Establish Landscape Connectivity of Expressways with Reference to Southern Expressway Sri Lanka

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Abstract : Construction of highway is the most emerging development tendency in Sri Lanka. With these development activities, there are a lot of environmental and social issues started. Landscape fragmentation is one of the main issues that highly effect to the environment by the construction of expressways. Sri Lankan expressway system getting effort to treat fragmented landscape by using highway crossing structures. This paper designates, a highway post construction landscape study on the effectiveness of the landscape connectivity structures to restore connectivity. Geographic Information Systems (GIS), least cost path tool has been used in the selected two plots; 25km alone the expressway to identify animal crossing paths. Animal accident data use as measure for determining the most contributed plot for landscape connectivity. Number of patches, Mean patch size, Class area use as a parameter to determine the most effective land use class to reestablish the landscape connectivity. The findings of the research express scrub, grass and marsh were the most positively affected land use typologies for increase the landscape connectivity. It represents the growth increased by 8% within the 12 years of time. From the least cost analysis within the plot one, 28.5% of total animal crossing structures are within the high resistance land use classes. Southern expressway used reinforced compressed earth technologies for construction. It has been controlled the growth of the climax community. According to all findings, it could assume that involvement of the landscape crossing structures contributes to re-establish connectivity, but it is not enough to restore the majority of disturbance performed by the expressway. Connectivity measures used within the study can use as a tool for re-evaluate future involvement of highway crossing structures. Proper placement of the highway crossing structures leads to increase the rate of connectivity. The study recommends that monitoring the all stages (preconstruction, construction and post construction) of the project and preliminary design, and the involvement of the research applied connectivity assessment strategies helps to overcome the complication regarding the re-establishment of landscape connectivity using the highway crossing structures that facilitate the growth of flora and fauna.

Keywords : landscape fragmentation, least cost path, land use analysis, landscape connectivity structures
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