Environmental Impact Assessment and Improvement of Ecological Performance of Nature Bridge Sidewalk Construction in the District 3 of Tehran

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Expanded Abstract

Introduction

With an increase in urban population, urban environmental pollution, change of lifestyle, urbanization, getting away from nature and environment, we can observe the increase in the need for comforting and attractive social spaces such as sidewalks in cities day by day.

Urban areas are amongst the zones that generate ecological and environmental impacts at several different scales. These zones include special ecosystems that have an important role in creation of problems and solutions to challenges for sustainable development. Sidewalks and urban green spaces are important components of urban life. With the importance of sidewalks in cities, it seems essential to pay attention to them.

Methodology

Nature Bridge in district 3 of Tehran, with an area of 7000 square meters is the first bridge in Iran that is merely sidewalk and connects the Water and Fire Park and the Taleghani Forest Park to each other. The Nature Bridge, apart from its economic and social importance is also important in ecological aspects and in need for more research and study.

The methodology of this paper is ecological evaluation of building the Nature Bridge Sidewalk. The ecologic structure of the region is studied first by using the DPSIR Model and then for the evaluation of the influences of the building of the Nature Bridge, the Iranian Matrix Method is applied using landscape ecology approach.

Results and Discussion

The results of this research show that construction of the Nature Bridge is ecologically thoroughly approved. Besides, among all the impacts, the improvement of ecologic performance of the region is the most important effect with 2 points. The consequences of the improvement of micro-impacts and the quality of air and plant habitats, jointly with 1.6 points, are considered as the most important consequences.

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The results also show that rehabilitation around the Nature Bridge to improve the ecological performance of the bridge is based on the landscape ecology principle, expanding the green patch of Water and Fire Park and Taleghani Forest Park.

Table 1. Tehran ecological structure analysis using DPSIR model in district number 3

Model Components	Driving Force	Pressure	State	Impact	Response
Result	Good condition of natural elements to plant development in the region. There is a large piece of land in the region, Tehran major communication axes through the area and etc.	Increase of population density, The high relative share of construction in the area, misuse of natural elements in the region and etc.	Good condition of green space area in the region, There are vast areas of Abbas Abad in the region, good condition of air corridor in the region and etc.	The destruction of the ecological quality through ill-considered projects, Cut the green corridors, Scattered patches of green space, and etc.	Connection of green corridors with green patch, connection of green patch together, increase of green space per capita in the region, and etc.

Table 2. Ecological assessment of nature sidewalk construction using Iranian Matrix

| **Impact Consequence**	Change of bridge to sidewalk	Connection of Water and Fire park to Taleghani park	Modern architecture and green design of the Nature bridge	Creation of ecological tourism region	Improvement of ecological performance of the region	Means of consequence of score point
Microclimate and air quality	2	1	1	1	3	**1.6**
Animal habitats	1	1	1	1	1	**1**
Plant habitats	2	2	1	1	2	**1.6**
Sense of place and social acceptance	1	1	2	1	2	**1.4**
Means of impact score point	**1.5**	**1**	**1.2**	**1**	**2**	
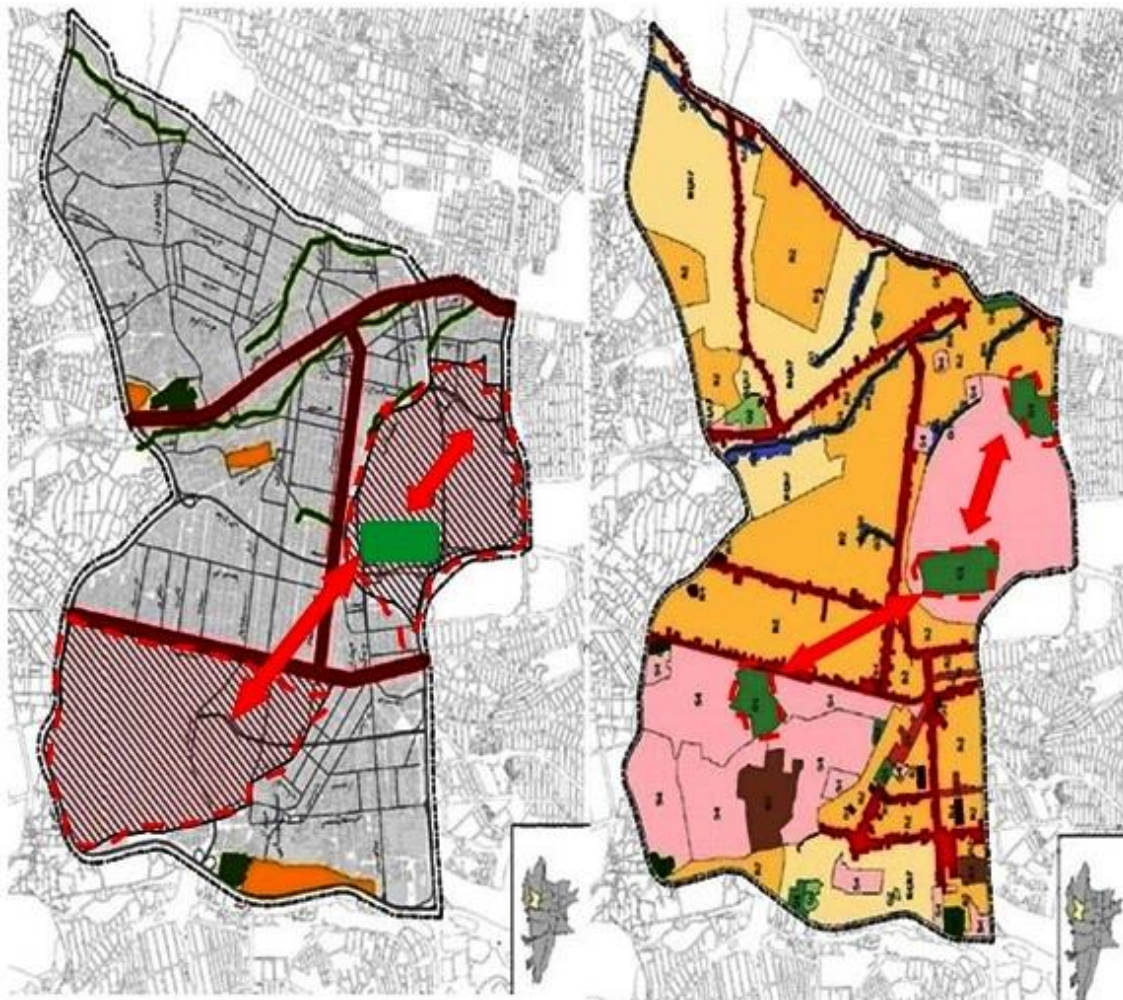
Fig. 1. Ecological connection of Water and Fire Park, Nature Bridge, Taleghani Forest Park patch with surrounding area; Connection with green spots around (right figure), Connection with areas in need of protection and rehabilitation (left figure)

Conclusion

Construction of the nature bridge without taking side events into account will cause the bridge to lose its attraction and turn into a simple place. Because of this, it seems essential to use the ecologic principles of building ecological attraction in the regions around the Nature Bridge. One of the basic rules is the connection and expansion of the green patches. The ecological urban development is followed in many developing cities of the world. One way to achieve this goal is to develop basic concepts of landscape ecology. Water and Fire Park, Nature Bridge, Taleghani Forest Park patch is the tourism area in Tehran. To improve this patch, it is connected to the other green areas and land uses.

Keywords: ecological impact assessment, Iranian Matrix, Nature Bridge, sidewalk, urban ecology.

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