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The Application of DPSIR in Restoring Urban Rivers

(Case Study: Darakeh and Farahzad River Restoration, Tehran-Iran)

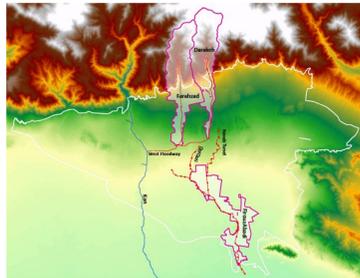


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Introduction

Darakeh and Farahzad are two connecting rivers that originate from the steep, large valleys of Alborz Mountains and flow a total 60km route through densely populated Tehran; however, modernization of Tehran has dramatically damaged these rivers and their beautiful valleys during the past 50 years. Modernized urban development has covered 32 km² of the 116 km² basin area.

Moreover, the rivers have suffered route alteration, waste and sewage disposal, loss of riparian vegetation and animal species. At some lengths, the rivers have been totally buried in concrete/masonry coffins (covered canals) in order to eliminate impacts.

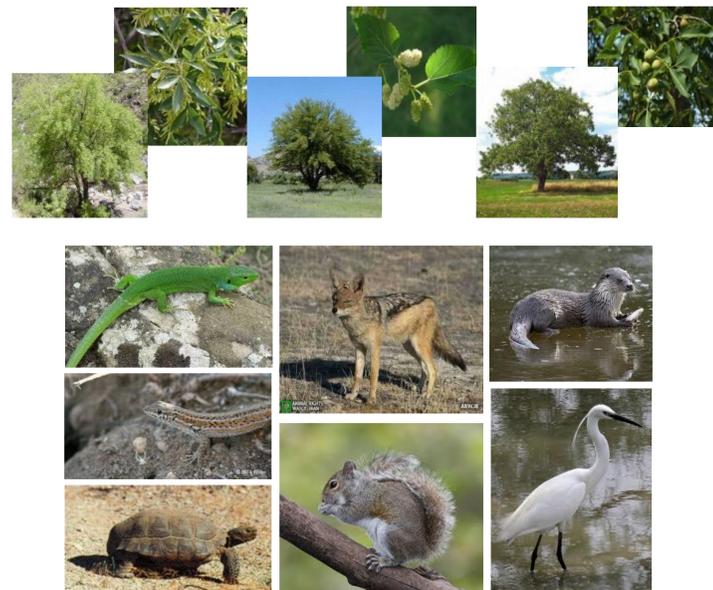


The valley landscape and the sight of the river has been completely ignored in urban planning. The surrounding residential area lacks appropriate connection to the valleys. So unintentionally, hiding spaces are created for the aggregation of social deviance behavior.

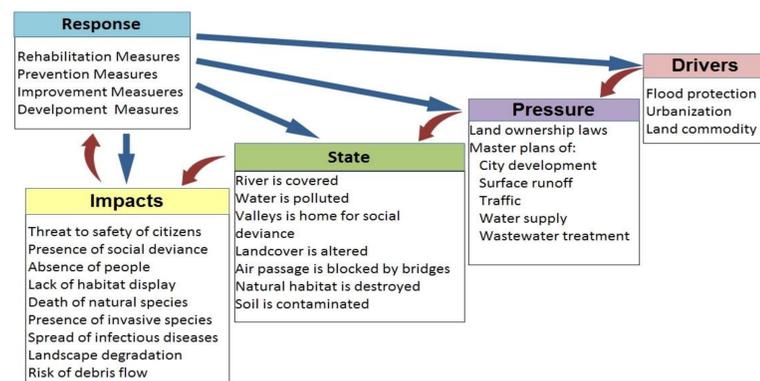


River Restoration

The condition of 1960, right before modernization, was considered for restoration. At that time, the basin was 220 km² wide and the rivers ran from the mountains at the north of Tehran all the way to the arid plain at south. Amazingly, the ecosystems were once rich in species, as the images below show.



The DPSIR Framework



DPSIR: Driver, Pressure, State, Impact

The DPSIR framework (EEA, 1999) was applied to identify the sustainable social, economic and environmental restoration measures.

Drivers: The study of Tehran's 400-year history reveals that flood has always been a threat. So, confronting flood along with modernization - inappropriate paradigm for



urban development- led to river canalization. Moreover, the price of property is high in Tehran, so land seekers have almost left no buffer for the rivers. Ultimately, the three main drivers are: *Confronting flood, Urbanization, Land Commodity*

Pressure: Land ownership laws and different master plans of city development, surface runoff, traffic, water supply, wastewater treatment, that inherit the modernization paradigm (master the forces of nature) are the main pressures.



State: As a result of above, the state of the rivers gradually changed through years. *They were covered by streets, polluted by waste and wastewaters, and home to residents with social deviance behavior. The natural basin is covered with urban structures, the air canyon is blocked by bridges, the natural habitat is destroyed, and the soil has become contaminated.*

Impact: The impacts changed river state are: *Invasive species, death of natural species, pollution and spread of infectious disease, lack of access, Lack of safety, presence of drug dealers and social deviance.*

DPSIR: Response

Response to the drivers, pressures, state and impacts form the list of restoration actions. Depending on which type of factor the action would address, it will be long-term, mid-term and short-term .



Restored Landscape

