

The Application of DPSIR in Restoring Urban Rivers, Case Study: Darakeh and Farahzad River Restoration, Tehran, Iran

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Urban river ecosystems, depending on their form, may serve the sprightliness of a city as a beating heart, breathing lungs or main vessels. In other words, sustaining the ecosystem of an urban river and its riparian land can lead to enhancing life quality indices in a city. The Concept of river ecosystem restoration, born out of sustainable development, underpins restoring the health of an urban environment that circles around its river ecosystem.

Darakeh and Farahzad are two connecting rivers that originate from the steep, large valleys of Alborz Mountains and flow a total 60km route through the densely populated city of Tehran. Their original basin was 220 km²; however, it has been tremendously altered during the past 50 years. Alongside with urban development and landuse changes, a large flood deviation canal has detached the northern and southern parts of the basin. In addition, river valleys have suffered from land degradation, occurring at the same time severe damages to the river and its riparian ecosystem.

In this study, a novel application of DPSIR framework in urban river restoration is introduced. For restoring an ecosystem in a sustainable manner, it is necessary to identify and analyze the social and economic drivers (D) that provide the root cause of ecosystem damages; their consequent pressures directly harming the river and land (P); the degraded state of land and river ecosystem (S) and its impacts on the environment (I). Such approach will enable a precise selection of interrelated technical, economic, social and environmental actions.

Thorough multidisciplinary study of Tehran's recent 400 years history revealed that three factors of "safety against flood", "urbanization" and "land commodity" were the main drivers triggering unsustainable development of Tehran, leading to numerous damages of Darakeh and Farahzad Rivers. Accordingly, pressures (P), degraded state (S) and its impacts (I) were determined. Eventually, restoration actions were extracted as appropriate responses (R) to drivers, pressures, state and impacts. Regarding the planning timeline, short-term actions correspond to impacts, mid-term actions address the pressure and state factors and finally, long-term actions comply with the drivers.

The application of DPSIR proved as a successful approach to holistic, comprehensive and systematic interpretation of the complicated issues for restoration of Darakeh and Farahzad rivers.

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