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GREEN INFRASTRUCTURE AND ENVIRONMENTAL RISK SCREENING FOR SANGARDAK MOUNTAIN TOURISM, UZBEKISTAN

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Abstract

This paper assesses proposed green and river-corridor infrastructure in the Sangardak mountain tourism centre, Uzbekistan, through a documentary environmental screening. The project materials specify two 500-m riverbank protection sections, a 3.5-km riverside pedestrian route, a 4.0-km upper-station access path and 5,640 planned seedlings. Species-level planting quantities are arithmetically consistent with the stated total. However, the documents contain differences in walkway budgets and ambiguity regarding planting area. A pressure–pathway–receptor screening identifies potential erosion, runoff, riverbank disturbance, vegetation-establishment and waste-management issues. Priority recommendations include site-specific hydraulic assessment, verified planting boundaries, seasonal visitor monitoring and survival-based vegetation maintenance. The analysis distinguishes proposed infrastructure from realized environmental outcomes and provides a practical baseline for subsequent field evaluation.

Keywords: green infrastructure; mountain tourism; river corridor; environmental screening; vegetation; Sangardak

Introduction

Mountain tourism development concentrates visitor flows, buildings and services in terrain where steep slopes, seasonal runoff and fragile vegetation may amplify environmental pressures. Riverbank engineering, pedestrian routes and tree planting are frequently proposed as mitigation measures, but their effectiveness depends on design suitability, ecological baseline conditions and long-term maintenance [1–4].

This paper develops a preliminary environmental management framework for the planned Sangardak tourism centre in Sariosiyo District, Uzbekistan. The objective is to distinguish documented interventions from demonstrated ecological benefits and to prioritize verifiable indicators for project implementation.

Materials and methods

Five categories of planning evidence were reviewed: riverbank protection, riverside pedestrian access, upper-station access, planting schedules and wider tourism investment proposals [5–7]. Reported quantities were checked for arithmetic consistency. Potential impact pathways were screened qualitatively using a pressure–pathway–receptor logic: construction or visitor pressure; runoff, erosion, waste or disturbance pathways; and river, soil, vegetation and visitor receptors. This screening ranks issues for investigation; it is not a measured environmental impact assessment.

The evidence base does not include a georeferenced site boundary, flood-frequency analysis, slope stability testing, vegetation-survival monitoring, water-quality observations or visitor counts. Accordingly, the results are expressed as proposed management priorities, not as quantified environmental risk estimates.

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Results and discussion

The river-corridor plan identifies two flood-protection sections of 500 m each, corresponding to 1.0 km of proposed engineered bank protection. It also describes a 3.5-km riverside walking route and a 4.0-km connection toward the upper cable-car station. These facilities may increase access and channel visitor movements, but their siting must consider flood conveyance, bank erosion, maintenance access and habitat continuity. The river-walk budget differs between planning slides (1.3 versus 5.0 billion UZS), so it cannot yet support a single validated unit-cost estimate.

The landscaping schedule lists 565 Crimean pine, 265 plus 1,185 Oriental arborvitae, 1,195 common juniper, 825 wild apple, 785 wild cherry and 820 bitter almond seedlings. The component counts sum to 5,640, consistent with the stated total. Nevertheless, these numbers describe proposed planting stock, not established vegetation. The project area is reported inconsistently across source materials; therefore density per hectare and predicted canopy coverage were not calculated.

Planting design should prioritize site-appropriate species, soil-water availability, slope stabilization and compatibility with local habitats. A simple planting count is an incomplete performance indicator: survival after the first and third growing seasons, replacement rates and irrigation demand are more informative. River works should be preceded by hydraulic and geomorphological assessments, with consideration of nature-based bank stabilization where technically suitable.

A monitoring plan should pair pressure indicators (daily visitors, trail use, waste generation) with response indicators (seedling survival, exposed soil, turbidity, riverbank condition and maintenance completion). Data should be collected before construction and at repeatable seasonal intervals so that observed changes can be separated from natural hydrological variability [2–4].

Proposed action	Documented scale	Monitoring priority
Riverbank protection	2 × 500 m	Bank condition, flood performance
Riverside walkway	3.5 km	Erosion, litter, visitor pressure
Upper-station access path	4.0 km	Trail condition, slope drainage
Tree and shrub planting	5,640 seedlings	1- and 3-year survival
Riverside route budget	1.3 or 5.0 bn UZS	Reconcile project estimates

Table 1. Document-based indicators; values describe planned infrastructure rather than measured outcomes.

Conclusion

The Sangardak planning documents provide a useful quantitative basis for environmental screening: 1.0 km of proposed riverbank protection, 7.5 km of planned pedestrian connections and 5,640 proposed seedlings. They do not establish that flood risk has been reduced or that ecological restoration has succeeded. Implementation should first verify the intervention boundaries and budgets, then undertake site-specific hydraulic and vegetation assessments, and finally establish a monitored maintenance programme. This approach can connect tourism investment with measurable environmental safeguards without overstating the evidence.

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