A Biomimetic Monsoon-Proof Landscape Master Plan

A Biomimicry 3.8 Project Example

Client
HOK

Industry
Architecture & Urban Planning

Challenge
Incorporate design concepts from the local ecosystem into master planning for Lavasa, a new city in the hilly region southeast of Mumbai, India

What We Did
To help the developed area avoid massive erosion during monsoon season, the Biomimicry 3.8 team collected, distilled, and translated biological intelligence from the region’s ecosystems to understand and explain how native forests handle monsoon precipitation (up to 27 feet of rainfall) without significant erosion.

Outcome
The ecological intelligence and biomimetic design concepts enabled HOK and the client to make more informed and innovative design decisions. This led to a more successful site design and master planning process, yielding measurable impacts such as:

- 70% of previously deforested land restored
- 30% reduction in carbon emissions
- 65% reduction in potable water consumption
- 95% reduction of waste sent to landfill
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How We Did It

Following a site assessment and inventory, our research determined the native ecological model evaporates 20–30% of rainfall from the forest canopy, while 60–65% infiltrates the soil, and only 10–15% flows into rivers and streams as surface run-off. To help HOK’s project team match this environmental performance standard (EPS) and achieve other goals through landscape planning, our biologists identified and described more than 20 unique organisms and design patterns in the local ecosystem that would best inform resilient and sustainable design. From mechanisms such as the drip tips of leaves and the root structures of Manilkara trees, we derived locally-tuned design strategies for shedding water, reducing erosion, recharging groundwater reserves, and other stakeholder priorities.

Extracted from the report, “Lavasa Genius of Place: Deep Dives”