

India's unique sustainability challenges

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How can we rethink sustainability in ways that are not only innovative but also deeply impactful? This article aims to answer this question in the context of India and its unique socio-economic and ecological position. It stems from my experiences documenting the course "Sustainability in the Indian context" at Azim Premji University in Bengaluru.

The course, designed for development practitioners and researchers, works with the "3F Framework," which emphasises three critical aspects: finitude, fragility, and fairness. This framework proposes a novel approach to both the study and the implementation of sustainability interventions, tailored specifically to the Indian context.

By focusing on the water crisis in India through the lens of this framework, I show how we can craft research methodologies and sustainability practices that are not only contextually relevant but also geared towards creating more substantial and credible impacts. In this sense, I aim to steer environmental discussions towards more effective and localized strategies, ensuring that sustainability efforts are both inclusive and impactful.

Finitude

Foremost, the notion of 'finitude' addresses the limited and finite nature of ecological resources, challenging the dominant focus on efficiency that characterises much of current sustainability research. A striking example of this can be found in a recent World Bank paper titled 'Trade and Infrastructure Integration in Africa', which proposes reducing transportation costs in Africa as a means to optimise the economy. This approach neglects the critical notion of resource limits, captured in Jevons's paradox. Originating from W.S. Jevons's classic work *The Coal Question*, the paradox suggests that technological improvements intended to enhance resource efficiency can inadvertently lead to increased consumption.

Adopting a perspective of finitude shifts the focus from merely improving efficiency to fundamentally altering consumption patterns. This approach aligns better with the real limits imposed by ecological resources and offers a more solid foundation for sustainability research.

Consider the case of water scarcity in urban India, where conventional solutions often involve technical fixes, such as diverting water sources. Bengaluru, India's proposed IT hub, is also grappling with water scarcity. It is home to one of the most significant inter-state conflicts that involves water allocation from the Cauvery River, which flows through Karnataka and neighboring Tamil Nadu.

However, through the lens of finitude, rather than working towards diverting water supply, the very necessity of reducing consumption becomes the focus. Urban planner and water expert Srikantaiah Vishwanath suggests an innovative alternative for Bengaluru's water: instead of constructing new dams, we could focus on rejuvenating and establishing one million small wells and aquifers through the Million Wells campaign. This strategy not only acknowledges the limits of resource availability but also promotes sustainable water management by preventing overexploitation.

By concentrating on managing consumption at its root, this approach offers a more sustainable solution than the endless pursuit of new water sources.

Fragility

The idea of fragility emphasises the vulnerability of ecosystems and human communities, highlighting the necessity for research attuned to these sensitivities. It recognises the interconnectedness of ecosystems and their susceptibility to human impacts.

A case from Jakkur Lake in Bengaluru is informative here. Originally constructed over 200 years ago, the lake had become heavily polluted with sewage and garbage.

After the major rejuvenation efforts by local bodies, the management of the lake was

handed over to the Bengaluru municipal corporation and a citizen's group named Jalaposhan in 2015. This transfer marked a significant shift in management strategy. The emphasis now was not just on lakes but their surroundings as well, foregrounding the lake's interconnectedness. People realised that Jakkur Lake supports a diverse ecosystem, including around 200 species of birds, and it has become a livelihood source for approximately 70 fishing families and 30 cattle owners.

The local fishing community played a crucial role in the lake's upkeep. They not only depended on the lake for their livelihood but also contributed to its maintenance and the promotion of eco-friendly practices.

In the new conservation strategy, the lake's ecosystem was seen as an intricate system involving local residents, fishermen, greenkeepers, municipal authorities, and real estate developers. Now, lake management was not just about managing the lake sewage treatment. The new management practices were geared towards sustaining the lake's biodiversity and supporting the livelihoods of the fishing community, thereby maintaining a delicate balance between ecological needs and human welfare. In this sense, the lake was seen as a social-ecological system, encompassing migratory birds gracing the waters, indigenous fish species thriving beneath the surface, and local communities around it.

Harini Nagendra, an ecologist from Bengaluru, describes fragility through the analogy of a spider web, which can sustain a few breaks but remains intact. However, each break brings it closer to a tipping point, where one additional break could cause it to collapse. This concept applies to ecosystems like Jakkur, where every species and interaction is critical. Research and practice that are alive to such interactions can make credible changes that lead to sustainable systems, as evident in Jakkur's revival.

Fairness

Fairness implies social and ecological justice, challenging us to reflect: Who bears the burden of environmental and social repercussions? The narrative extends to ensuring equitable resource distribution, equal opportunity, and a balanced approach to ecological conservation and restoration.

This discourse is particularly pertinent to India, where socio-economic disparities, historical caste oppression, and unequal power relations continue to challenge state-led sustainability measures. Highlighting the intricacies of the caste system that mediate access to resources in India, Abhijit Waghre has argued against the invisibilisation of marginalized communities within Indian environmental studies. Writing on access to water, Waghre shows how lower-caste communities often face physical barriers to accessing clean water. They might have to walk long distances to fetch water from

sources that are deemed 'appropriate' for their use.

In urban areas, the caste impact on water access is less visible but equally significant. A recent study has shown that lower-caste populations are often concentrated in slums and peripheral areas where municipal water supply is irregular or non-existent, forcing reliance on contaminated groundwater or expensive water vendors.

Interdependencies

Each component of the framework is not just interrelated but interdependent, implying that effective sustainability practices must incorporate all three aspects to be successful. In the case of water management, recognising the limits of water availability (finitude) is crucial for maintaining ecological balance and preventing the kind of environmental degradation that leads to increased vulnerability and diminished resilience of the ecosystem (fragility).

If a resource like water is scarce (finitude), ensuring its fair distribution becomes even more critical, as inequity can lead to conflict and further strain on the resource. Fairness ensures that conservation efforts, such as those at Jakkur Lake, do not just restore ecological health but also support the livelihoods and rights of all community members, particularly those who depend on these ecosystems for their survival.

A comprehensive review of India's sustainability strategies, mindful of its distinctive hurdles, is urgently needed. True environmental stewardship in India (and the Global South) will hinge on an inclusive approach that addresses both the ecological and socio-economic dimensions, ensuring that sustainability efforts are equitable and far-reaching. In this line, the 3F's framework offers a comprehensive approach that integrates the ecological limits, the sensitivity and interdependence of ecosystems, and the need for equitable access and distribution of resources.

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