Designing with Nature:

Biodiversity as Infrastructure in Contemporary Architecture

For decades, sustainability in architecture has largely been framed around energy, materials, and efficiency. While these remain critical, a parallel conversation is gaining urgency - one that positions biodiversity not as a soft layer of landscape, but as essential infrastructure within the built environment.

Globally, leading practices are beginning to move in this direction. From Singapore's "City in a Garden" approach to Europe's biodiversity net gain policies, the emphasis is shifting toward buildings that actively contribute to ecological systems rather than merely reducing harm. For senior architects working in India's rapidly urbanising context, this presents both a challenge and an opportunity: to rethink the role of architecture as a mediator between human and non-human life.

At a strategic level, biodiversity integration begins with site intelligence. Understanding existing ecological patterns - soil conditions, hydrology, native species, and seasonal variations - can inform design decisions from the outset. Instead of clearing sites to create a tabula rasa, projects can be conceived as extensions of existing ecosystems. This approach not only reduces environmental disruption but also strengthens long-term resilience.

Internationally, several design strategies offer valuable direction. Green roofs are evolving beyond aesthetic installations into layered habitats that support pollinators and birdlife. In cities like London and Toronto, guidelines now recommend specific substrate depths

and planting palettes to ensure ecological performance. Similarly, facade systems are being designed with integrated nesting modules and ledges, as seen in parts of the Netherlands, where biodiversity-inclusive design is embedded in building codes.

Water systems, too, are being reimagined. Rather than treating stormwater as waste, projects are incorporating bioswales, retention ponds, and constructed wetlands that double as habitats. These systems not only mitigate flooding but also reintroduce biodiversity into dense urban areas. In arid regions, landscape strategies are focusing on xeriscaping with native species, reducing water demand while supporting local ecologies.

For India, the translation of these ideas must remain context-specific. Native planting is critical - not just for ecological reasons, but also for maintenance and cultural familiarity. Urban projects can incorporate layered landscapes that transition from public to semi-wild zones, allowing biodiversity to coexist with human use. Even in high-density developments, terraces, podiums, and edges can be designed as ecological corridors rather than residual spaces.

However, integrating biodiversity requires moving beyond checklists and certifications. It calls for interdisciplinary collaboration - with ecologists, hydrologists, and local communities - to ensure that interventions are meaningful and measurable. It also demands a shift in aesthetic sensibilities. Biodiverse landscapes are dynamic, sometimes untidy, and constantly evolving. Designing for them requires a degree of openness and restraint.

In the framework of Sustainable Futures: People. Place. Planet., biodiversity integration strengthens all three. It enhances human well-being through richer, more engaging environments, grounds architecture in its ecological context, and contributes to planetary health by restoring fragmented systems.