



## Balancing Development & Conservation

*This editorial is based on "[Ken-Betwa river project: Balancing development with ecological concerns](#)" which was published in Business Standard on 31/12/2024. The article brings into focus the Ken-Betwa River Linking Project, India's first major river-interlinking initiative, highlighting its long-awaited commencement after 29 years and the critical debate it sparks between development and environmental conservation.*

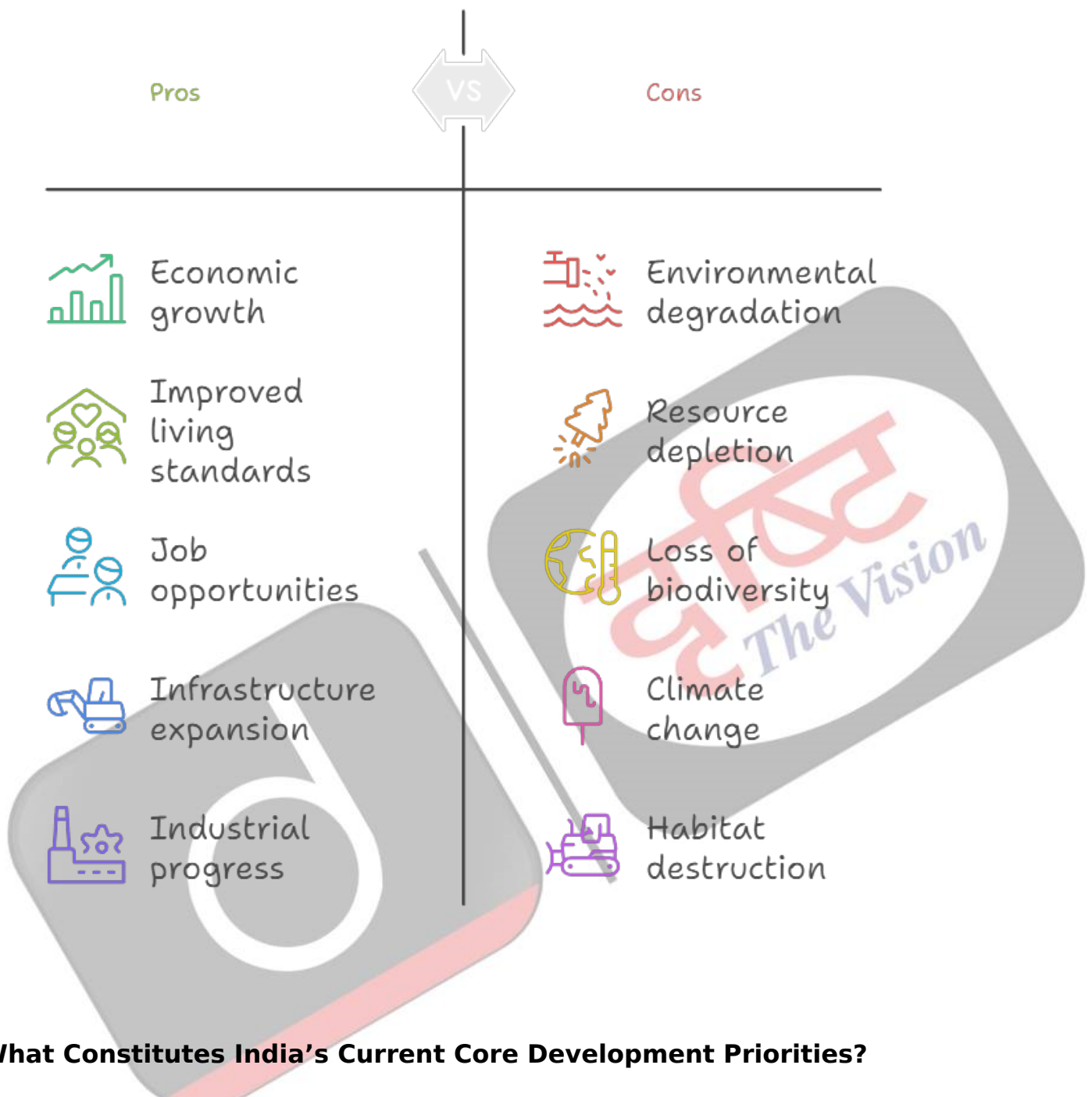
**For Prelims:** [Ken-Betwa River Linking Project](#), [Development](#), [Environmental conservation](#), [National Infrastructure Pipeline](#), [Gati Shakti](#), [National Infrastructure Pipeline](#), [Green Hydrogen Mission](#), [Green Hydrogen Mission](#), [PM Vishwakarma Yojana](#), [Rural Female Labour Force Participation Rate](#), [Semicon India](#), [Nari Shakti Vandan Adhiniyam 2023](#), [Beti Bachao Beti Padhao](#), [Defence sector](#), [Digital Agriculture Mission](#), [PM-KISAN scheme](#).

**For Mains:** India's Current Core Development Priorities, Key Environmental Concerns Arising out of Development Aspirations.

The [Ken-Betwa River Linking Project](#), which received its ceremonial inauguration recently, stands as a watershed moment in India's ambitious river-interlinking vision. 29 years after its conception, this first-of-its-kind venture among **16 proposed river-linking projects has finally broken ground**, igniting fresh debates about the **delicate balance between development and environmental conservation**. As excavators ready their blades and engineers unfurl their blueprints, the Ken-Betwa project serves as a critical lens through which to examine the broader narrative of progress in modern India, **where every developmental stride must be measured against its ecological footprint**.

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## Development vs. Conservation



### What Constitutes India's Current Core Development Priorities?

- **Infrastructure Development:** India's economic ambitions are **centered around creating world-class infrastructure to enhance productivity, facilitate trade, and attract investments.**
  - A strong infrastructure base not only supports industrial growth but also bridges regional disparities by connecting remote areas to mainstream economic activities.
  - Initiatives like the **National Infrastructure Pipeline (₹111 lakh crore over 5 years)** and **Gati Shakti** aim to integrate sectors and improve connectivity.
  - In 2023-24, the capital expenditure allocation was raised to **₹10 lakh crore (3.3% of GDP)**, signaling the government's infrastructure-centric growth model.
- **Climate Change Mitigation and Renewable Energy Transition:** Addressing climate change is a critical priority for India as it seeks to balance development with environmental sustainability.
  - Transitioning to renewable energy and low-carbon technologies is imperative to reduce

greenhouse gas emissions while ensuring energy security for its growing economy.

- The **Green Hydrogen Mission (₹19,700 crore)** and **solar energy expansion (installed capacity at 71 GW in 2023)** underscore this shift.
  - As of **October 2024**, renewable energy-based electricity generation capacity stands at **201.45 GW**, accounting for **46.3% of the country's total installed capacity**, aligning with its Paris Agreement commitments.
- **Human Capital Development:** Investing in human capital is vital for India's socio-economic transformation.
  - Improving **education and healthcare** ensures an empowered, healthy, and skilled workforce, which is indispensable for sustained growth.
  - The **PM e-Vidya scheme** expanded digital education for childrens during Covid-19, while **Ayushman Bharat covers over 50 crore citizens with health insurance**.
  - India's literacy rate has risen to **77.7%** and the **Infant Mortality Rate reduced from 32 per 1000 live births in 2018 to 28 per 1000 live births in 2020**.
- **Financial Inclusion and Digital Economy Expansion:** India's emphasis on digital and financial inclusion aims to democratize access to financial services and accelerate socio-economic upliftment.
  - Bridging the digital divide empowers rural and urban populations, enabling seamless economic participation and fostering equitable growth.
  - In 2024, **Unified Payments Interface (UPI)** processed around 172 billion transactions, marking a **46% increase from 118 billion in 2023**, driving **financial democratization**.
  - The **Jan Dhan Yojana** has brought **53 crore unbanked individuals into the financial system**, supporting poverty alleviation and equitable growth.
- **Employment Generation and Rural Empowerment:** Generating sustainable employment is key to addressing India's demographic challenges and ensuring rural prosperity.
  - Targeted programs for skills enhancement and industrial growth play a pivotal role in reducing unemployment and empowering rural communities.
  - The **PM Vishwakarma Yojana (₹13,000 crore)** is enhancing traditional artisans' livelihoods, while **MGNREGA** continues as a rural employment safety net.
  - There is a notable rise in **Rural Female Labour Force Participation Rate** from 19.7 % in 2018-19 to 27.7% in 2020-21, reflecting measures' impact.
- **Technological Innovation and Industry 4.0:** Technology is a cornerstone of India's strategy to become a global economic leader, enabling economic diversification, boosting efficiency, and creating high-value jobs.
  - Pioneering initiatives aim to establish **India as a hub for advanced manufacturing and innovation**.
  - Programs like **Semicon India (₹76,000 crore)** aim to make India a global semiconductor hub, reducing dependence on imports.
  - The IT and BPM industries' revenue is estimated at US\$ 245 billion in FY 2023, while **Artificial intelligence (AI)** is expected to **add \$967 billion to the Indian economy by 2035**.
- **Social Justice and Gender Equality:** Fostering an inclusive society is a key development priority for India, emphasizing equitable opportunities for marginalized groups and addressing systemic inequalities.
  - Legal reforms and targeted schemes ensure that economic growth translates into social upliftment.
  - The **Nari Shakti Vandan Adhiniyam 2023** seeks 33% representation in Parliament and state legislatures, and **Beti Bachao Beti Padhao** has improved child sex ratios.
  - The **SC/ST scholarships and EWS reservation policy** further uplift underrepresented groups.
- **Defense Modernization and Strategic Autonomy:** Strengthening India's defense capabilities and achieving self-reliance in defense production are crucial for national security and global strategic autonomy.
  - Investments in **indigenous manufacturing** reduce reliance on imports and boost technological capabilities.
  - **Defence sector allocated 13% of Budget 2024**, emphasis is placed on indigenous weapon production under Make in India.
    - **The exports of defense equipment, worth ₹16,000 crore in FY**

**2022-23**, underline India's progress toward self-reliance.

- **Urban Development and Smart Cities Mission:** Transforming urban spaces into resilient, efficient, and sustainable ecosystems is central to India's development strategy.
  - Smart cities aim to harness technology and innovation to address urban challenges and improve citizens' quality of life.
  - As of July, 2024, the **100 cities under the Mission have successfully completed 7,188 projects**, accounting for **90% of the total projects**, fostering digital and physical infrastructure in urban areas.
- **Agriculture Modernization:** Enhancing agricultural productivity through sustainable practices and technological innovation is vital for achieving food security and doubling farmers' incomes.
  - Market reforms and financial support are driving rural growth.
  - The **Digital Agriculture Mission** and **e-NAM (National Agriculture Market)** have improved market linkages for farmers.
  - The **country's agri exports are expected to cross \$50 billion in 2024-25** on account of healthy demand and lifting curbs on non-basmati rice, and the **PM-KISAN scheme** provided more than **₹2 lakh crore in direct benefits to farmers since inception**.
- **Industrial Growth and Manufacturing Boost:** India is prioritizing industrial growth to establish itself as a global manufacturing hub and create employment opportunities.
  - Policies like **"Make in India"** and the **Production Linked Incentive (PLI)** scheme aim to boost domestic manufacturing and reduce import dependency, fostering economic self-reliance.
  - Sectors like **electronics, pharmaceuticals, and textiles** have seen substantial investments. India is keen to increase the share of manufacturing in GDP from **17-18% to 25%**
- **Tourism and Cultural Heritage Development:** India's rich cultural heritage and diverse landscapes offer immense potential for tourism-led economic growth.
  - Efforts to promote heritage conservation and ecotourism aim to boost local economies while preserving cultural identity.
  - The **PRASHAD Scheme** and **Dekho Apna Desh** initiative aim to revitalize heritage sites.
  - The total **Foreign Tourist Arrivals (FTAs) stood at 9.52 million in 2023**, contributing significantly to foreign exchange earnings and local economies.

## What are the Key Environmental Concerns Arising out of Development Aspirations?

- **Deforestation and Habitat Loss:** Rapid urbanization and infrastructure development are compromising India's ecological balance.
  - The clearing of forests for **highways, mining, and urban projects** has not only displaced wildlife but also disrupted ecological services, such as carbon sequestration and groundwater recharge.
  - Projects in eco-sensitive zones, like the **Hasdeo Aranya forest in Chhattisgarh**, exemplify the ongoing conflict between development and conservation.
  - According to the FAO, the **rate of deforestation in India was 668 kha per year** between 2015 and 2020, while species like the **Great Indian Bustard** are critically endangered due to habitat encroachment.
- **Air Pollution from Industrialization:** India's industrial growth has come at the cost of clean air, with rising emissions from factories, power plants, and vehicles causing severe public health crises.
  - The lack of stringent enforcement of pollution norms and dependency on fossil fuels exacerbates the problem.
  - In 2023, **India accounted for 39 of the world's 50 most polluted cities** (IQAir report). Cities like **Delhi and Kanpur** consistently feature among the most polluted globally, with PM2.5 levels far exceeding WHO standards.
- **Water Stress and Over-Extraction:** The **over-reliance on groundwater for agriculture** and industry has led to alarming depletion levels, threatening the sustainability of India's water resources.
  - Poor irrigation practices and excessive water-intensive cropping patterns compound the problem, particularly in already arid regions.
  - Of the farmers using irrigation in the country, **70-80%**



- are **groundwater dependent**, with aquifers in Punjab and Haryana at critical levels.
- According to the **NITI Aayog**, **600 million Indians face extreme water stress and over half of India's 605 rivers** were found to be polluted by the **Central Pollution Control Board in 2022**
- **Land Degradation and Soil Erosion: Unsustainable land use, driven by deforestation and exploitative agricultural practices**, is causing widespread soil erosion and desertification.
  - This undermines agricultural productivity and threatens food security in a country heavily reliant on its agrarian economy.
  - **Land degradation is a major environmental issue in India**, with nearly **30% of its land already affected**.
    - Around **100 million hectares are degraded**, with 3 million hectares added between 2004 and 2019.
- **Marine Pollution and Coastal Erosion: Unchecked industrial and urban waste disposal into oceans has severely impacted marine ecosystems, while rampant coastal development has accelerated erosion.**
  - These issues not **only threaten biodiversity** but also undermine the livelihoods of coastal communities.
  - India leads globally in plastic waste production with an **annual output of 9.3 million tonnes**.
    - A recent study reveals that India burns **5.8 million tonnes and releases another 3.5 million tonnes** into the environment each year
  - A study by the **National Centre for Coastal Research (NCCR)** reveals that **33.6% of India's coastline is eroding**, 26.9% is accreting, and 39.5% remains stable.
- **Climate Change and Extreme Weather Events: Developmental activities have amplified greenhouse gas emissions**, exacerbating climate change and increasing the frequency of extreme weather events.
  - These disruptions have severe socio-economic impacts, particularly on vulnerable populations.
  - India's **greenhouse gas emissions surged by 6.1% in 2023**, contributing to 8% of the global total emission.
  - India experienced extreme weather events on **85 out of 92 days in 2023**, including floods, cyclones, and heatwaves.
- **Urban Waste Management Crisis: India's urbanization has outpaced the infrastructure needed to manage the rising volume of waste, leading to environmental degradation and public health risks.**
  - The situation is aggravated by insufficient waste segregation and recycling mechanisms.
  - India generates **62 million tonnes of waste annually** and **only 70% is collected, and 12 million tonnes are treated**.
    - The **Ghazipur landfill in Delhi, which caught fire in 2023**, exemplifies the severity of this crisis.
- **Loss of Wetlands and Natural Carbon Sinks: The encroachment and degradation of wetlands, crucial for carbon sequestration and biodiversity, are alarming.**
  - The unregulated expansion of urban areas and infrastructure projects has resulted in their rapid decline.
  - A study by **Wetlands International (WI)** shows nearly **2 out of every 5 wetlands** in India have lost their natural existence in the last 30 years.
- **Lack of Sustainable Tourism Practices: Unregulated tourism** in fragile ecosystems has led to waste accumulation, biodiversity loss, and ecosystem degradation.
  - Hill stations and coastal regions are particularly vulnerable to over-tourism.
  - Places like **Ladakh saw a drastic increase in tourist footfall between 2015 and 2023**, resulting in waste management crises and water shortages.
  - For instance, **Goa state has witnessed a sharp decline in mangrove** areas over the last three decades.

## How India can Balance Developmental Aspirations with Environmental Sustainability?

- **Renewable Energy Transition for a Low-Carbon Economy: Transitioning to renewable energy** is crucial for reducing **greenhouse gas emissions while meeting energy demands**.

- India must integrate **grid-scale renewable energy storage systems to address intermittency challenges** and invest in offshore wind and decentralized solar energy for rural electrification.
- Strengthening policy frameworks like **Renewable Purchase Obligation (RPO)** and incentivizing green hydrogen production can secure energy independence and sustainability.
- **Sustainable Urbanization and Climate-Resilient Infrastructure:** India must adopt urban planning models that **incorporate green infrastructure, energy-efficient buildings, and zero-waste policies.**
  - **Mixed land use, vertical green spaces, and climate-resilient infrastructure** must become standard in urban expansions.
  - Integrating initiatives like the **Smart Cities Mission** with **sustainable urban drainage systems, urban forestry, and renewable-powered public transportation** can mitigate urban ecological stress.
- **Forest Conservation and Community-Driven Afforestation:** To balance development with forest preservation, India needs **stricter enforcement of compensatory afforestation laws and enhanced monitoring of ecological offsets.**
  - Community-based afforestation projects and promoting agroforestry can simultaneously boost livelihoods and biodiversity.
  - Policies like the **National Forest Policy** should integrate advanced satellite-based forest cover monitoring and incentivize eco-sensitive tourism to protect biodiversity.
- **Enhanced Environmental Governance and Green Financing:** Strengthening **Environmental Impact Assessments** to include public consultation at all stages, independent expert panels, and robust monitoring systems can reduce project-related ecological damage.
  - India needs to tap its potential of Green Financing as **it is the second-largest issuer of green bonds among emerging markets**, funding projects like renewable energy parks.
  - TCS and Infosys are leading by example with annual sustainability reports.
- **Integrated Water Resource Management:** India must adopt integrated water management by combining **rainwater harvesting, wastewater recycling, and aquifer recharge to ensure equitable water distribution.**
  - Encouraging the use of drip and sprinkler irrigation through subsidies can reduce over extraction in water-stressed regions.
  - **Strengthening watershed development** and **interlinking rivers** in an ecologically sensitive manner can balance agricultural and industrial water needs.
- **Circular Economy and Sustainable Consumption:** Building a circular economy framework is essential to minimize resource extraction and waste generation.
  - **Encouraging industries to adopt closed-loop production systems** and consumers to shift to sustainable goods can reduce environmental pressures.
  - Policies integrating **Extended Producer Responsibility (EPR), decentralized waste management**, and large-scale composting of biodegradable waste are essential for systemic change.
- **Electrification of Transport and Green Mobility:** Decarbonizing the transport sector requires a robust push for **electric vehicles, hydrogen fuel-cell vehicles, and bio-CNG buses.**
  - Strengthening EV manufacturing, battery recycling, and charging infrastructure will accelerate clean mobility adoption.
  - Policies like the **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles** must be complemented with **city-level initiatives** for congestion pricing and vehicle scrappage incentives.
- **Climate-Smart Agriculture for Resilient Food Systems:** Promoting climate-resilient agriculture through **precision farming, conservation tillage, and integrated pest management** is key to sustainable productivity.
  - Expanding **crop insurance, agroforestry, and resilient seed varieties** can mitigate risks associated with climate change.
  - Encouraging **renewable-powered cold storage** and **supply chains** can reduce post-harvest losses and enhance agricultural sustainability.
- **Marine Ecosystem Protection and Blue Economy:** India must strengthen marine protection through policies addressing **overfishing, mangrove deforestation, and marine plastic pollution.**
  - **Sustainable fishing practices, eco-tourism, and renewable offshore energy** can

harness the blue economy without ecological degradation.

- **Coastal regulation zones** must be strictly implemented to protect vulnerable ecosystems from unregulated industrial development.
- **Behavioral Change and Grassroots Sustainability:** Promoting public awareness campaigns on energy conservation, waste segregation, and sustainable consumption is essential for lasting impact.
  - **Eco-literacy programs in schools and local governance bodies** can cultivate a culture of sustainability.
  - Leveraging community-based initiatives like **Self-Help Groups (SHGs)** for decentralized waste management and renewable energy adoption can empower grassroots efforts.



## Conclusion

India's development aspirations, exemplified by projects like the Ken-Betwa River Linking, must **balance economic progress with environmental sustainability**. Transitioning to renewable energy, adopting sustainable urbanization, and enhancing environmental governance are key to **reconciling development with ecology**. India's future growth hinges on ensuring that ecological integrity is preserved alongside its ambitious developmental goals, aligning with **SDG 6 (Clean Water and Sanitation), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Action)**.

### **Drishti Mains Question:**

Economic development often leads to increased resource consumption and environmental degradation. How can India reconcile its pursuit of economic growth with the need for sustainable development?

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### **Prelims**

**Q. In the 'Index of Eight Core Industries', which one of the following is given the highest weight? (2015)**

- (a) Coal production
- (b) Electricity generation
- (c) Fertilizer production
- (d) Steel production

**Ans: (b)**

### **Mains**

**Q.1** “Industrial growth rate has lagged behind in the overall growth of Gross-Domestic-Product(GDP) in the post-reform period” Give reasons. How far are the recent changes in Industrial Policy capable of increasing the industrial growth rate? **(2017)**

**Q.2** Normally countries shift from agriculture to industry and then later to services, but India shifted directly from agriculture to services. What are the reasons for the huge growth of services vis-a-vis the industry in the country? Can India become a developed country without a strong industrial base? **(2014)**

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