

August 14, 2026

Where the Crabs Are Disappearing First

By: Sourabh Kumar Dubey

Odisha's beaches face unregulated tourism pressures degrading fragile ecosystems, evident in declining ghost crab populations and rising litter. Without science-based zoning and recognition of informal waste workers, short-term tourism gains risk long-term ecological loss.

A few years ago, several newly emerging beaches along the Odisha's coastline existed as quiet, bioresource-rich landscapes shaped by the dynamic interplay of rivers and the sea. Today, many of these stretches such as Bagda-Dublagadi, Dagara (both Balasore district), Aryapalli (Ganjam district), and Astaranga (Puri district) are crowded with visitors, dotted with homestays, and buzzing with motorised recreation.

Many of these so-called "offbeat destinations" are not beaches in the conventional sense. They are geomorphologically young systems—sandflats, mudflats, and accreting shorelines, formed by estuarine-coastal dynamics, riverine sediment deposition, coastal currents, and periodic cyclonic disturbances. Such transient geomorphic features are inherently fragile, constantly evolving, and ecologically rich. Yet, they are increasingly being treated as open-access recreational spaces. What has changed is not just their visibility, but the speed at which human pressure has outpaced ecological understanding and governance.



Tourism Outpacing Ecology

The transformation has been rapid. Social media platforms, particularly YouTube, Instagram, and Facebook, have amplified their appeal, turning once-remote coastal stretches into "trending viral destinations".

Informal homestay models are proliferating without ecological guidelines. On weekends and holidays, these beaches experience heavy footfall, with artificial lighting, noise, and recreational activities extending well into the night.



A recent study along the Odisha coast identified [five dominant categories of beach litter](#): plastic, foam, metal, rubber, and glass, which are largely linked to tourism, domestic waste, and fishing activity. Most litter accumulates between the shoreline and high tide mark, gradually degrading coastal habitats and affecting both terrestrial and marine ecosystems. Beyond aesthetics, plastic and debris injure infauna, alter sediment chemistry, and introduce microplastics into nearshore food webs.



Vanishing Bioindicators

One of the earliest signs of ecological stress is the decline of small, often overlooked species such as Ocypodid red ghost crabs (*Ocypode macrocera*) and horn-eyed ghost crabs (*Ocypode brevicornis*). Once conspicuous in intertidal zones from Balasore to Ganjam, these crabs are now increasingly scarce in many tourist-dominated stretches.



These ghost crabs are more than just inhabitants of sandy shores; they are classic ecosystem engineers. [Their burrowing aerates sediments](#), enhances nutrient cycling, and maintains beach structure. Their burrows support diverse infauna and microbial communities that drive coastal biogeochemistry.



Once described as "[red carpet beaches](#)" due to dense red ghost crab populations, stretches like Dagara, Talasari, Chandipur, and Balaramgadi are now witnessing their rapid disappearance. Pockets of abundance persist in relatively undisturbed areas such as the Devi river mouth and parts of Astaranga, but these too are under increasing pressure as tourism expands to support seasonal livelihoods. While these crab species lack formal conservation status, their decline signals deeper ecological disruption.

Cascading Ecological Impacts

The impacts of unregulated tourism are multifaceted. Frequent trampling compacts sand, collapses burrows, and destroys microhabitats. Motorised activities such as bike racing and amateur vehicle rides further alter sediment properties and directly kill intertidal fauna. Evidence indicates that even [low-frequency vehicle movement can significantly alter](#) sediment structure and reduce infaunal abundance.

Noise and artificial lighting disrupt shorebirds, while plastic waste and construction degrade habitat quality. Without intervention, such impacts can lead to long-term degradation.



The implications extend far beyond small fauna. Odisha's coastline is globally significant for marine biodiversity, including mass nesting of [olive ridley turtles](#) (*Lepidochelys olivacea*), listed as "vulnerable" on the IUCN Red List of Threatened Species. Even outside primary [nesting sites like Rushikulya](#), disturbances such as light pollution and beach compaction can affect turtle behaviour and reproductive success. [Study](#) also report that in the Chilika lagoon, tourism pressure is affecting habitats of the endangered [Irrawaddy dolphin](#) (*Orcaella brevirostris*).



The coast also hosts two species of [horseshoe crabs](#) (*Tachypleus gigas* and *Carcinoscorpius rotundicauda*), often called "living fossils" for their 200?million?year evolutionary continuity. Globally, horseshoe crabs are now emerging as key indicators of shoreline health,

much like seagrasses and mangroves, because their survival depends on intact, minimally disturbed intertidal zones. The study has confirmed that horseshoe crab populations on India's east coast have declined sharply under combined pressure from habitat loss, incidental catch, and coastal development. What begins as localised tourism pressure is rapidly scaling into a regional ecological risk.

Livelihood Paradox

Tourism undeniably contributes to local incomes and the state economy. Although there is lack of granular data, Odisha's tourism sector accounts for 13% of the state's GDP and provides employment opportunities in coastal regions. However, its sustainability remains questionable.

An overlooked dimension is the emergence of an informal workforce managing tourism's waste footprint. Women waste pickers are increasingly visible on these beaches, collecting, sorting and selling plastic debris along the shoreline. Their work provides critical ecosystem services such as reducing entanglement risk and microplastic leakage but remains unrecognised and unsupported. Integrating these workers into formal waste management and circular economy schemes could simultaneously strengthen both livelihoods and environmental resilience.

Lax Enforcement

India has a robust policy framework for coastal and tourism management governed by a combination of national environmental laws and state-specific tourism policies. The Coastal Regulation Zone (CRZ) Notification is the primary national regulation that restricts construction and industrial activities within a specific distance from the High Tide Line to protect the fragile coastal ecosystem. The National Strategy for Sustainable Tourism 2022 launched the Sustainable Tourism Criteria for India (STCI), which sets comprehensive sustainability standards specifically for the beach and backwater sectors to promote environmentally responsible tourism.



Odisha has also adopted its own Odisha Tourism Policy 2022 and emphasises sustainable and responsible tourism. Odisha hosts two Blue Flag-certified beaches, Golden Beach (Puri) and Sunapur (Ganjam), which must meet international standards for water quality, safety, and environmental management. Yet, implementation remains weak. Enforcement is inconsistent, site-specific guidelines are lacking, and awareness campaigns are poorly linked to habitat protection.

The core issue, however, is a governance gap. These emerging beaches fall into a regulatory blind spot: too new for dedicated management frameworks, yet too heavily used. Existing coastal regulations, including the CRZ framework, often lack the granularity required to address site-specific pressures in such emerging landscapes. There are no clear guidelines on carrying capacity, zoning, or permissible activities in many of these areas.

Beach Management

Conserving Odisha's emerging beaches requires a shift from open-access use to science-based management. Micro-zonation is a practical starting point. Different sections of a beach serve distinct ecological functions and should be managed accordingly. Conservation must also move beyond charismatic megafauna to include functionally critical species like ghost crabs.



In practice, this means legally backed zoning, controlled access, seasonal protections timed to nesting and migration cycles, and ongoing ecological monitoring. It also means formalising the informal—recognising and supporting the waste pickers who already keep these beaches clean.



Community-centric Solutions

A sustainable pathway must be community-led. Local youth can be trained as beach stewards, linking conservation with employment. Homestays and tourism operators can be integrated into the STCI eco-certification systems with incentives for responsible practices. Also, citizen science can be strengthened and village councils empowered to enforce zoning and benefit-sharing arrangements, in line with global moves towards community-led conservation and co-management of coastal areas.



Tourists themselves must also be reframed, not merely as sources of pressure, but as potential partners in conservation. Awareness campaigns, guided eco-walks, and "leave no trace" principles can foster more responsible behavior and deepen appreciation of coastal ecosystems.

Beyond Biodiversity

These beaches are not just ecological assets, they are natural buffers against storms and coastal erosion, critical for a cyclone-prone state like Odisha. Their degradation undermines both biodiversity and long-term coastal resilience.



Odisha's emerging beaches are being discovered faster than they are understood, and degraded faster than they can recover. The question is no longer whether development will happen, but whether it will be ecologically informed. If managed thoughtfully, these landscapes can become models of balanced coastal use where biodiversity, livelihoods, and tourism coexist. If not, they risk becoming yet another case of short-term gain at the cost of long-term sustainability.

Sourabh Kumar Dubey (s.dubey@cgiar.org) is a Scientist of Aquatic Food Systems at WorldFish, a Consultative Group on International Agricultural Research (CGIAR) research organisation.

The views and opinions expressed are his own and do not necessarily reflect those of the organisation.