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EDITORIAL ANALYSIS

What Mangroves Do That Seawalls Cannot

DOWN TO EARTH

6 June 2026 · ENVIRONMENT · GS3

CURATED & WRITTEN BY

Bharat Choudhary

UPSC Educator & Content Creator

linkedin.com/in/epicbharat

What Mangroves Do That Seawalls Cannot

Down to Earth 6 June 2026 GS3

Source: ujiyari.com — Free UPSC & State PCS Current Affairs

INTERVIEW ANGLE

"If mangroves outperform seawalls on cost and co-benefits, why does coastal policy still default to concrete, and what would it take to change that incentive?"

Source: Original editorial ↗ Down to Earth

Every fact web-verified against primary sources HOW

WHY THIS MATTERS NOW

As India hardens its coasts against rising seas with seawalls and embankments, a quieter argument is gaining force: **mangroves do the job better and cheaper**, while also storing carbon and sustaining livelihoods. With World Environment Day spotlighting nature-based solutions, the contrast between "grey" concrete and "green" ecosystems is a sharp GS3 case on **ecosystem-based adaptation**, climate finance, and how India spends its coastal-protection rupee.

THE CRUX IN 60 WORDS

India defaults to costly **seawalls** while underusing **mangroves**, which dissipate storm surge, resist erosion, regenerate after damage, and add **blue carbon, fisheries and biodiversity** co-benefits. A key barrier is that **restoration often is not classified as eligible "adaptation"**, so it misses climate finance that flows to concrete. The answer is **hybrid grey-green defences** plus fixing the finance-classification gap.

THE ISSUE, DECODED

CONCEPT	WHAT IT MEANS	WHY IT MATTERS
Ecosystem-based adaptation	Using nature to adapt to climate impacts	The alternative to grey infrastructure
Blue carbon	Carbon stored by coastal/marine ecosystems	Mangroves are major stores
Grey vs green defence	Engineered (seawall) vs natural (mangrove)	The core policy choice
Classification gap	Restoration not counted as "adaptation"	Blocks access to climate finance

THE ANALYSIS: WHY MANGROVES BEAT SEAWALLS

1. **Better protection.** Mangrove roots dissipate wave energy and surge, trap sediment, and reduce erosion, and they recover after storms, unlike a depreciating wall.
2. **Cheaper over time.** Seawalls are costly to build and maintain and can worsen erosion on adjacent coasts.
3. **Co-benefits.** Mangroves store blue carbon, nurse fisheries, support livelihoods, and shelter biodiversity, none of which concrete provides.
4. **The finance barrier.** Because restoration is often not classified as eligible adaptation, funding flows to grey infrastructure by default.

DATA AND INSTITUTIONS VAULT

India has roughly **4,900-5,000 sq km** *of mangrove cover (ISFR), the* **Sundarbans** *being the largest single block and a UNESCO World Heritage Site and Ramsar site.* **Schemes: MISHTI** *(Mangrove Initiative for Shoreline Habitats and Tangible Incomes) promotes mangrove restoration; coastal regulation under* **CRZ Notification**. **Concept: blue carbon** *(carbon in mangroves, seagrass, salt marshes);* **ecosystem-based adaptation (EbA)**. **Global frame:** *the* **Paris Agreement** *adaptation finance; the* **Global Goal on Adaptation***; the Ramsar "wise use" principle for coastal wetlands.* **Disaster link:** *mangroves reduced damage in past cyclones and the 2004 tsunami in some stretches.*

THE DEBATE

Argument for engineered defences: On densely built or very high-energy coastlines, seawalls may be unavoidable, and mangrove restoration is slow and site-dependent.

Argument for nature-based defences: Mangroves outperform on cost and co-benefits and are more resilient, so concrete-by-default wastes money and ecological opportunity.

The balanced verdict: Not either-or. The answer is **hybrid grey-green** defences, mangroves as the first line, engineering where genuinely needed, plus fixing the finance-classification gap so nature-based adaptation can be funded.

HOW TO THINK ABOUT THIS (TRANSFERABLE SKILL)

> *Grey infrastructure often looks decisive because its function is visible and immediate, while green solutions are undervalued because their benefits are diffuse and long-term. The strong answer compares* **whole-life cost plus co-benefits**, *which usually reframes the choice. This lens applies to energy, water, urban design and disaster management.*

DIAGRAM-IN-WORDS

`Rising seas + storms -> default to seawalls (costly, depreciating, can worsen erosion).` The alternative: `mangroves (surge protection + blue carbon + fisheries + biodiversity) + hybrid grey-green + fixed finance classification -> cheaper, multi-benefit coastal defence.`

THE WAY FORWARD

1. **Protect and restore mangroves** through schemes like MISHTI.
2. **Adopt hybrid grey-green defences**, engineering only where genuinely needed.
3. **Fix the classification gap** so ecosystem-based adaptation qualifies for climate finance.
4. **Integrate mangroves into coastal-zone and disaster planning**, treating them as infrastructure.

THE TAKEAWAY BOX

"Ecosystem-based adaptation can outperform engineered defences on India's coasts." Examine the case for mangroves over seawalls and the barriers to scaling it. (250 words)

"A seawall protects a coast and does nothing else; a mangrove protects the coast, stores carbon, feeds a fishery and shelters a forest, the cheapest infrastructure India keeps mistaking for scenery."

Mangrove cover ~4,900-5,000 sq km (ISFR) · Sundarbans (UNESCO + Ramsar) · MISHTI scheme · CRZ Notification · blue carbon · ecosystem-based adaptation.

If mangroves beat seawalls on cost and co-benefits, why does coastal policy still default to concrete?

Connects to GS3 PYQs on coastal ecology, disaster management and climate adaptation; probable forward question is the mangroves-over-seawalls framing above.

today's 100th Ramsar site article (wetlands as buffers); static GS3 on coastal ecosystems and climate adaptation.

Sources: Down To Earth, MoEFCC, Forest Survey of India

Source: What Mangroves Do That Seawalls Cannot — Ujiyari.com | Free UPSC & State PCS Editorial Analysis

KEY ARGUMENTS AT A GLANCE

India over-invests in costly engineered "grey" coastal defences such as seawalls while underusing ecosystem-based adaptation through mangroves, which deliver superior storm protection plus livelihood co-benefits, and classification gaps keep mangrove restoration from qualifying for international climate-adaptation finance.

✓ SUPPORTING

- Mangroves dissipate wave energy and storm surge, reduce erosion, and recover after damage, whereas seawalls are expensive, degrade over time, and can worsen erosion elsewhere.
- Mangroves also sequester carbon (blue carbon), support fisheries and livelihoods, and shelter biodiversity, co-benefits a concrete wall cannot provide.

- Because restoration is often not classified as eligible "adaptation," it struggles to attract international climate finance, biasing spending toward grey infrastructure.

⚠ COUNTER

Some argue that in densely built or high-energy coastlines, engineered defences are unavoidable, and that mangrove restoration is slow and site-dependent, so it cannot fully substitute for seawalls.

→ WAY FORWARD

Prioritise hybrid "grey-green" defences, restore and protect mangroves, fix classification so ecosystem-based adaptation qualifies for climate finance, and integrate mangroves into coastal-zone and disaster planning.

🧠 **PRACTICE TODAY'S QUIZ**

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✍ MAINS ANSWER FRAMEWORK

QUESTION

"Ecosystem-based adaptation can outperform engineered defences on India's coasts." Examine the case for mangroves over seawalls and the barriers to scaling it. (250 words)

INTRODUCTION

India's coasts face rising seas and fiercer storms, and the default response has been concrete, seawalls and embankments. A growing body of evidence suggests nature does the job better and cheaper.

BODY

Mangroves are a natural coastal defence: their dense root systems dissipate wave energy and storm surge, trap sediment, reduce erosion, and, crucially, regenerate after damage, whereas a seawall is a depreciating asset that is expensive to build and maintain and can intensify erosion on adjacent stretches. Beyond protection, mangroves deliver co-benefits no wall can match, they sequester "blue carbon," nurse fisheries that sustain coastal livelihoods, and shelter rich biodiversity.

The puzzle is why policy still defaults to grey infrastructure. Part of the answer is institutional and

financial: ecosystem-based adaptation such as mangrove restoration is often not classified as eligible "adaptation" under international climate-finance rules, so it struggles to attract funding that flows readily to engineered projects.

There is a genuine counter-point, on densely built or very high-energy coastlines, engineered defences may be unavoidable, and restoration is slow and site-specific. But this argues for hybrid "grey-green" solutions rather than concrete by default.

The way forward is to protect and restore mangroves, combine them with engineering where needed, fix the classification gap so nature-based adaptation can access climate finance, and embed mangroves in coastal-zone and disaster-management planning. Protecting the coast and the climate can be the same act.

CONCLUSION

India should stop treating mangroves as scenery and start treating them as infrastructure. Hybrid defences and finance reform can let nature do what concrete cannot, protect coasts while storing carbon and sustaining livelihoods.

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