



CURRENT AFFAIRS



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NATIONAL CONFERENCE ON PROMOTION OF SEAWEED CULTIVATION

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "SEAWEED CULTIVATION". THIS TOPIC IS RELEVANT IN THE "ENVIRONMENT & ECOLOGY" SECTION OF THE UPSC CSE EXAM.

WHY IN THE NEWS?

The National Conference on Promotion of Seaweed Cultivation was recently held in Gujarat's Kutch region at Koteswar (Kori Creek). Its goal was to establish seaweed farming throughout India, focusing on encouraging the practice to increase fish farmers' income and diversify their marine output.

ABOUT SEAWEEDS

- Seaweeds, often called **macroalgae**, are a broad category of photosynthetic organisms that are found in abundance in marine habitats.
- Seaweeds have many uses for humans and are essential to marine ecosystems while being frequently overlooked by larger marine animals.
- Red, green, and brown algae are examples of seaweeds. Seaweeds can develop in lakes, rivers, the ocean, and other bodies of water

SEAWEED DISTRIBUTION:

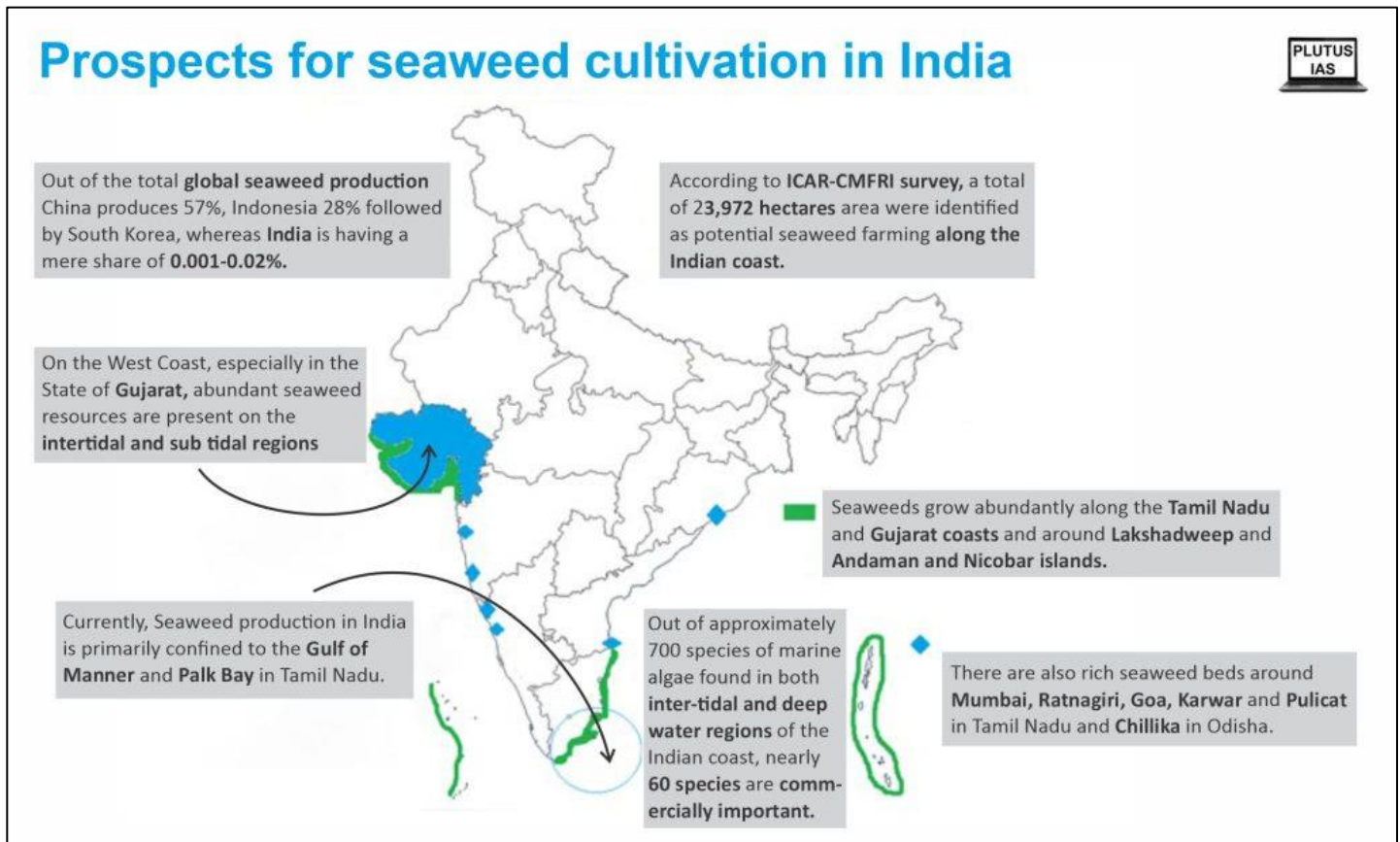
Seaweeds are found in many habitats throughout the world's oceans, ranging from deep-sea ecosystems to intertidal zones. Several variables, including temperature, light availability, nutrient levels, and substrate type, affect the spread of seaweeds.

1. **Intertidal Zones:** Many seaweed species have adapted to the shifting conditions in these areas, where they are periodically submerged at high tide and exposed to the air during low tide. There are difficulties in this ecosystem, like desiccation and uneven light levels. Seaweeds like Ulva (sea lettuce) and Fucus (rockweed) are common intertidal species.
2. **Subtidal Zones:** A range of seaweed species can find a stable habitat in subtidal zones, areas outside low tide. Large brown algae of the species Laminaria, known as kelps, are characteristic subtidal zone residents that create dense underwater forests in cooler seas. There is a wide variety of marine life in these kelp forests.
3. **Deep-Sea Environments:** Some red algae can survive in the marine environment because they are acclimated to low light levels. Certain red algae may survive in deeper seas without sunshine,

adding to the seafloor's richness. Coralline algae and their calcified structures influence coral ecosystems in the deep ocean.

CENTRAL SEAWEED BEDS IN INDIA:

The beaches of Gujarat and Tamil Nadu, as well as the area surrounding Lakshadweep and the Andaman & Nicobar Islands, are rich in seaweed resources. There are notable seaweed beds around Mumbai, Goa, Varkala, Karwar, Vizhinjam, and Pulicat in Tamil Nadu, Ratnagiri, Andhra Pradesh, and Chilka in Orissa.



ECOLOGICAL SIGNIFICANCE OF SEAWEEDS:

Seaweeds hold immense ecological significance, contributing to the health and functioning of marine ecosystems in several ways.

OXYGEN PRODUCTION:

Seaweeds are primary producers capable of photosynthesis, converting sunlight into energy. During this process, seaweeds absorb carbon dioxide and release oxygen, contributing significantly to the oxygen levels in marine environments. This oxygen production is crucial for supporting aquatic life, especially in areas with high seaweed biomass.

HABITAT AND SHELTER:

Seaweeds provide habitat and shelter for a diverse array of marine organisms. The three-dimensional structures created by seaweeds, such as kelp forests, offer hiding places, breeding grounds, and feeding

areas for fish, invertebrates, and other marine life. These habitats enhance overall biodiversity in coastal and subtidal zones.

NUTRIENT CYCLING:

Seaweeds play a vital role in nutrient cycling within marine ecosystems. Seaweed's uptake of nutrients from the water helps regulate nutrient levels and prevent excessive nutrient runoff, which can lead to issues such as algal blooms. This nutrient cycling contributes to the overall health and balance of marine ecosystems.

COASTAL PROTECTION:

Certain species of seaweeds help stabilize coastlines by reducing the impact of waves and storms. Seaweed beds can act as a natural buffer, absorbing wave energy and preventing erosion of coastal areas. This coastal protection is precious in regions vulnerable to storm surges and rising sea levels.

APPLICATIONS OF SEAWEEDS

- In culinary realms, they are cherished in **Asian cuisines**, with red algae-derived Nori featuring prominently in sushi rolls. Moreover, red algae contribute to the food industry through agar-agar and carrageenan as gelling agents and stabilisers in various products.
- Seaweeds exhibit **pharmaceutical potential**, with extracts displaying anti-inflammatory, antioxidant, and antiviral properties, sparking ongoing research for medicinal use.
- **In agriculture**, seaweeds act as natural fertilisers and soil conditioners, enhancing plant growth and resilience.
- Their carbohydrate-rich composition positions certain seaweeds as a promising **biofuel feedstock**, contributing to sustainable energy alternatives.

CHALLENGES IN THE CONSERVATION OF SEAWEED

CLIMATE CHANGE IMPACT:

Rising temperatures and ocean acidification threaten seaweed populations, disrupting physiological processes. Conservation strategies must tackle the broader context of climate change for effective mitigation.

HABITAT DEGRADATION:

Coastal development, pollution, and destructive fishing practices compromise seaweed ecosystems. Conservation measures should prioritise habitat protection, restoration, and sustainable coastal development practices.

OVERHARVESTING AND EXPLOITATION:

Unregulated harvesting for food, pharmaceuticals, and biofuel production raises concerns. Conservation efforts must implement sustainable practices, regulations, and monitoring to prevent overexploitation.

INVASIVE SPECIES:

The introduction of invasive species poses a threat to native seaweeds, disrupting ecological balance. Conservation strategies should focus on the prevention and mitigation of the impact of invasive species.

POLLUTION AND CONTAMINATION:

Agricultural runoff, industrial discharges, and marine debris negatively impact seaweed health. Conservation efforts must address pollution sources and promote sustainable waste management practices.

DISEASE OUTBREAKS:

Like any organism, seaweeds are susceptible to diseases, leading to rapid population declines. Conservation strategies involve monitoring, understanding causes, and implementing prevention and management measures.

LACK OF PUBLIC AWARENESS:

Limited awareness hinders conservation efforts. Educational initiatives are crucial to raising awareness about Seaweed's roles in marine ecosystems and the need for conservation.

GLOBAL CONNECTIVITY:

Seaweeds, part of interconnected marine ecosystems, require global conservation efforts. Collaborative initiatives and international partnerships are crucial for effective conservation on a worldwide scale.

GOVERNMENT INITIATIVES

- The **mission of Seaweed Mission** is to commercialise seaweed production and processing to add value. It also seeks to extend farming over 7,500 km of shoreline in India.
- Establishment of Multi-Purpose Seaweed Park in Tamil Nadu.

PRELIMS PRACTICE QUESTIONS

Q1) Consider the following statements:

- 1) Seaweeds are a staple in Asian cuisine
- 2) Agar-agar is derived from fungi and is used as a gelatin substitute in the food industry
- 3) Seaweed species thrive maximum in the Intertidal zone

How many of the above statements are *Not* correct

- a) One
- b) Two
- c) Three
- d) None

ANSWER: A

MAINS PRACTICE QUESTION

Q1. Explain the significance of reducing plastic pollution in the context of sustainable ocean conservation. Provide practical solutions for minimising plastic waste in marine environments.

Q2. Analyse the economic and social aspects of sustainable ocean conservation. How can sustainable practices be economically viable and socially equitable for communities dependent on marine resources?

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