

The Impact of Seawater Agriculture on Aquatic Resource Management

Coastal communities worldwide face major challenges such as overfishing, habitat destruction, and ecosystem degradation, which threaten livelihoods and marine biodiversity. Traditional aquatic resource management has often failed to address these complex issues, prompting the exploration of innovative solutions like seawater agriculture — the cultivation of salt-tolerant plants (halophytes) irrigated with seawater, integrated with ecosystem restoration.

Benefits

Reduces nutrient pollution: Using aquaculture wastewater to irrigate halophytes prevents eutrophication and creates a closed-loop nutrient system.

Supports fishery rehabilitation: Provides alternative livelihoods for fishers, allowing overexploited stocks to recover.

Enhances biodiversity: Integration with mangrove restoration supports diverse marine and terrestrial species; e.g., Eritrea's project boosted bird biodiversity by 1,000%.

Protects coastlines: Mangroves reduce erosion, storm surge damage, and enhance climate resilience.

Promotes carbon sequestration: Halophytes and mangroves store large amounts of carbon, contributing to climate change mitigation and carbon credit opportunities.

Challenges

Salinisation of soil and freshwater if seawater is mismanaged.

Ecological disruption if projects are poorly located or use non-native halophytes that become invasive.

High financial and regulatory barriers, including unclear policies around blue carbon credits and limited investment incentives.

Key Success Factors

Strong policy frameworks regulating environmental impacts, invasive species, and community engagement.

Commercial responsibility in adopting environmentally sound practices and selecting suitable sites.

Research and development to improve halophyte varieties and adapt them to local conditions.

Government incentives such as tax breaks, grants, and clear carbon crediting mechanisms to attract investment.