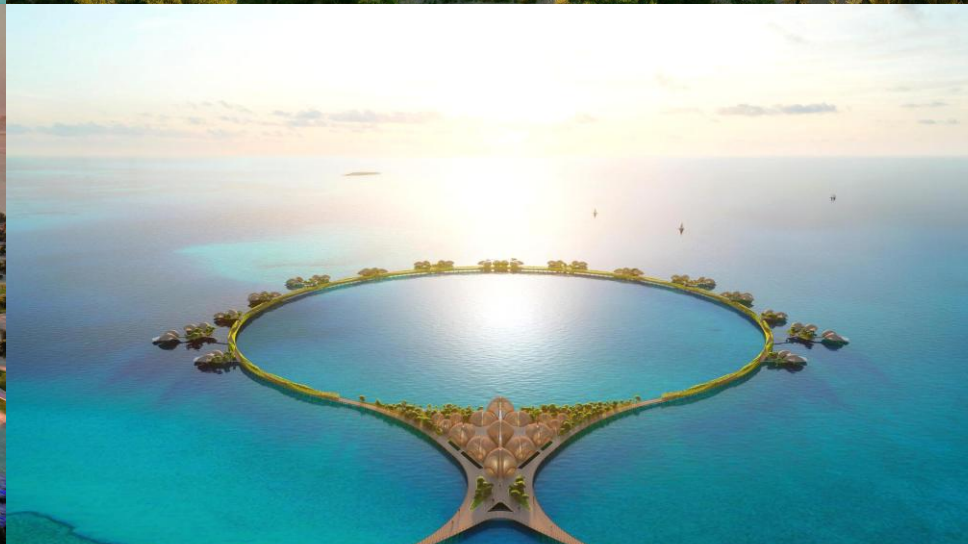
The Red Sea Project



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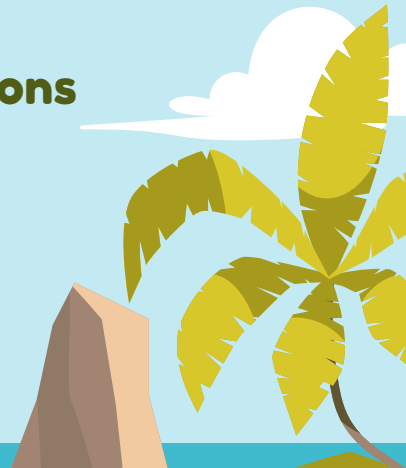

1. Red Sea Project Overview

About the Red Sea Project	• **Launched**: **2017** – Part of Saudi Arabia's Vision 2030 • **Location**: 28,000 km² along the **Red Sea coast** • **Developer**: **Red Sea Global** (RSG), owned by Saudi Arabia's Public Investment Fund • **Goal**: Luxury, sustainable and regenerative tourism • Aims to **diversify the economy** and **reduce oil dependency** • Seeks to **promote leisure tourism** beyond religious tourism • Designed to propel Saudi Arabia into the **ranks of top global tourist destinations**
Key Features	• **90+ untouched islands**, coral reefs, mangroves, volcanoes • **Phase I** (by 2023): 16 hotels, 3,000 rooms • **Phase II** (by 2030): 50 hotels, 8,000+ rooms • **Red Sea International Airport** (100% renewable-powered)
Environmental Focus	• Only **25% of islands** to be developed • **9 islands** designated as **conservation zones** • **30% net conservation** benefit target by 2040 • **LEED Platinum** & **ISO 21401** sustainability standards
Biodiversity Hotspot	• Home to **endangered turtles**, **reef fish**, **orcas**, **dugongs**, **sharks** • Coral and nesting habitats of global significance
Challenges	• **Balancing development** with **ecological conservation** • **Managing construction impact** and **long-term sustainability**

2. Impacts on Water

Construction Phase

Sedimentation from Dredging and Infilling smother corals and reduces water clarity and quality potentially harming coral life

Chemical Runoff and Potential Spills from concrete and chemicals can lead to localized pollution and negatively impact marine life

Underwater Noise Pollution from construction works disrupt marine mammals' communication and fish schools' behavior, reproduction and survival rates

Habitat Degadation, specially in zones rich in coral reefs, seagrasses, mangroves and fishes like the Al Wajh Lagoon

Operational Phase

Brine Discharge from desalination increases sea water salinity levels and temperature, which can jeopardize reefs health

Tourism Pressure on Coral Reefs through recreational activities like scuba diving and boating can damage reefs physically

2. Positive Measures on Water

Sustainable Water Supply

Solar-powered desalination facility
→ Avoids fossil fuel reliance and groundwater depletion

KAUST Partnership

Development of a low-impact desalination process, that neutralizes chemicals in the brine
→ No chemicals discharge into the sea

Greywater Reusage

Closed-loop reuse system
→ Treated water is used to irrigate landscape, avoiding sewage water in the sea

3. Impacts on Earth

Construction Phase

Soil Erosion from heavy machinery used in construction

Biodiversity Loss, via the land use of native desert species, which are highly sensitive to human presence

Permanent Alteration of Natural Landscapes through the development of roads, resorts, and other infrastructure

Solid and Hazardous Waste from construction, further strains local systems (if not properly managed) and poses risks to human health

Light noise pollution from construction sites, disrupts nocturnal desert species whose survival depend on natural cycles of darkness and quiet

Operational Phase

Soil Degradation due to the widespread use of four-wheel-drive vehicles for both recreational purposes and transportation, and which can damage vegetation (often in an irreversible manner)

Exploitation of Underground Water Resources, to support tourism infrastructure may lead to long-term depletion, as these aquifers do not easily replenish through rainfall in arid climates

Pressure on Marine Ecosystems, due to tourism development in coastal and island areas, leading to water pollution, loss of habitats and marine wildlife

Ligh Pollution artificial lights from beachfront resorts and houses which threatens the survival of some marine animals

3. Positive Measures on Earth

Environmental Assessments

Environmental Assessments were conducted prior to the construction phase

The environmental impact on soil and biodiversity shape the construction decisions of the project

Zero waste to Landfill

Development of a strategy which mandates that all construction waste must be minimized and sustainably managed

This strategy includes sorting, segregating, and managing both general and recyclable waste streams

4. Air Impacts

Construction Phase

Dust Emissions from earthworks in arid zones reduces air quality and dust particles can settle on coral reefs and pose risk to the workers

Air Pollution due to diesel-powered machinery (CO_2, NO_x and PM emissions) reduces air quality and contributes to global warming through greenhouse effect

Logistics Carbon Footprint from longer transportation routes increases fossil fuel consumption and GHG emissions

Noise Pollution from construction machinery interferes with bird and marine animals' communication, inducing stress and disturbing their natural behavior

Operational Phase

Air Pollution caused by air traffic (CO_2, NO_x and potential contrail clouds) contributes to global warming through greenhouse effect

Light Pollution from artificial lighting disorients animals like turtles disturbing their natural behavior and reducing hatchlings' survival rate

Noise Pollution due to air traffic disturbs animal behavior

4. Positive Measures on Air

Renewable Energy Strategy

100% off-grid solar and wind power, large battery storage → Replaces fossil fuel reliance, preventing SO_2, NO_x, and CO_2 emissions age

Clean Mobility

Fully electric vehicle fleet (no combustion land vehicles and boats allowed)
→ Expected to prevent 500,000 tons of CO_2 per year

Aviation Pollution Mitigation

SAF (safe aviation fuel) usage and distribution plan
→ Can reduce each flight emissions by up to 35%

Construction Best Practices

Real time dust monitoring system
Green concrete from construction waste materials
Off-site modular prefabrication strategy
→ Lower the projects carbon footprint

5. Socioeconomic Impacts

Job Creation for Local Communities	• The Red Sea Project is expected to **create tens of thousands of jobs across various sectors**, contributing to the diversification of the Saudi economy
Training for Local Communities	• The Red Sea Project has **partnered with Oracle to train 5,000 young Saudi in IT skills**, which are particularly relevant to hotel and resort operations across RSG's destinations • RSG has launched an **"English for Tourism" Program**, offering six months of online English training, equipping local communities for tourism-related careers
Strategic Partnerships to empower Local Communities	• **The *Red Sea Farms Cooperative*** was created to support the development of the agricultural sector in Tabuk • RSG launched ***Jewar***, a digital app designed to enhance community engagement • RSG launched the ***Amerah Souq***, the first market to unite the city's farmers, artisans, and family-owned businesses on a single place, allowing locals to showcase and sell their products and encouraging economic
Creation of a Staff Village	• To guarantee **good living conditions for the large project's workforce** and to o ensure job satisfaction and motivation, as well as welfare of employees
Training and Development of employees	• The company provides **free training programs to its workforce, partners, and contractors**, with a focus on essential construction and safety skills • To support mental and physical health, RSG launched **HAYAH, a wellbeing program that serves over 4,500 employees**

5. Socioeconomic Impacts
(continued)

Improvement of the local infrastructures	• Construction of **77km of roads**, and the **Red Sea International Airport**
Boost of the tourism industry	• The sector will have a boost with the Red Sea Project **attracting high-net-worth individuals, foreign investments, and international brands**
Lack of equity and loss of cultural heritage	• Although local residents have gained access to more jobs**, nationals often serve a luxury tourism sector primarily designed for wealthy international visitors, which can exacerbate inequality** • Increased tourism risks **diluting local heritage and traditions**, as the cultural landscape adapts to cater to foreigners' expectations

4. Integration of Tools

Environmental Impact Assessment (EIA)	• Used to evaluate the environmental consequences of specific project components like hotels, marinas and airport infrastructure • Helps identify **risks to coral reefs**, **turtle nesting beaches** and **seabird habitats** • Based on **extensive field surveys** (including 200+ turtle nests, 193 reef fish species) • Multispectral cameras, satellite imagery and benthic sensors for **real-time environmental monitoring** • Mitigation actions such as **restricting development to 22 of 90+ islands**, creating **9 conservation zones** and **limiting tourists to 1 million** per year • Applied continuously throughout construction for real-time management
Strategic Sustainability Assessment (SSA)	• Provides a broader, long-term framework aligning the project with Saudi Vision 2030 and the Saudi Green Initiative • Ensures **compliance with sustainability targets** such as the **30% net conservation benefit** by 2040 and meeting ***LEED*** and ***Mostadam certifications*** • Aligns project with **UN Sustainable Development Goals**: - **SDG 6** (Clean Water): renewable desalination - **SDG 7** (Clean Energy): solar-powered infrastructure - **SDG 13** (Climate Action): carbon neutrality goals - **SDG 14 & 15**: protection of marine and terrestrial biodiversity through habitat restoration
Life Cycle Assessment (LCA)	• Assesses environmental impact across the full project life cycle – from construction to decommissioning • Evaluates energy use, material sourcing, water systems and waste management • Analyzes use of **760,500 solar panels** and **renewable water systems** • Guides decisions on **wastewater recycling** and **energy efficiency** • Supports **zero-waste-to-landfill goal** and **circular economy principles**

6. Recommendations – Soil

Goal: ensure the long-term sustainability and ecological integrity of the Red Sea project

Soil erosion and degradation

Controlled-access zoning and phased construction to limit disturbance. Immediate soil stabilization methods —such as mulching or erosion control mats — will be applied post-clearance, along with long-term soil monitoring to assess site recovery and inform adaptive management

Biodiversity Loss

Incorporating wildlife corridors and enforcing seasonal restrictions that align with ecological patterns. Where impact is unavoidable, biodiversity offsets should be implemented to ensure a net-positive environmental outcome

Solid and Hazardous Waste

Maximizing on-site waste segregation and recycling, minimizing the use of toxic materials and ensuring the safe handling of hazardous substances. Construction and operational phases will both include clear protocols and sustainability-focused procurement

Underground Water Resources

Solar-powered desalination for freshwater needs, the use of groundwater monitoring wells, and the integration of greywater recycling systems. Landscapes should feature native, drought-resistant plants supported by efficient irrigation systems to minimize water use

6. Recommendations – Water

Goal: ensure the long-term sustainability and ecological integrity of the Red Sea project

Sedimentation from Dredging and Infilling

Restricting dredging activities to non-breeding seasons, using silt curtains, and conducting turbidity monitoring throughout construction. Adopt low-impact dredging techniques and reroute sediment plumes away from ecologically sensitive areas using hydrodynamic modeling.

Chemical Runoff and Spills

Implement strict controls on construction materials and fuel handling, including bunded storage, emergency spill kits, and runoff filtration systems to prevent contamination of surrounding marine environments. Prepare an oil spill contingency plan and equipment on standby (booms + skimmers ready).

Habitat Degradation

Protect critical marine habitats by establishing exclusion zones around coral reefs and mangroves. Implement a carrying capacity for tourists, green fins certification for Marine activities and support habitat restoration through coral transplantation or artificial reef programs.

Brine Discharge

Install multi-port diffusers to spread the brine over a larger area and enhance dilution, combined with pre-discharge dilution to lower salinity. Avoid sensitive ecosystems like coral reefs and seagrass meadows. Tracking salinity, temperature, and ecological changes in discharge areas.

6. Recommendations – Air

Goal: ensure the long-term sustainability and ecological integrity of the Red Sea project

Dust Emissions

Control dust from construction activities by regularly watering exposed surfaces, covering loose materials during transport, and using wind barriers. Enforce low-speed limits on unpaved roads to reduce airborne particulate matter. Biodegradable binders to bind soil particles (lignin).

Air Pollution

Promote the use of electric and hydrogen-powered transport systems. Limit fossil fuel-based machinery and install air quality monitoring stations. Develop a comprehensive carbon accounting and offsetting system. offer incentives or preferred slots to airlines operating with SAF.

Noise Pollution

Reduce decibel levels at the source, block propagation, or protect receptors. Schedule high-noise activities during the day and install sound barriers around construction zones near sensitive habitats. Use quieter equipment models and maintain buffer zones to protect local wildlife.

Light Pollution

Use downward-facing, fully shielded lighting to prevent light trespass into natural habitats. Adopt motion-sensor lights and low-intensity LED fixtures with warm color temperatures to preserve dark skies and reduce disruption to nocturnal species. Preserve unlit zones for migratory species.

Thank You!

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6. Recommendations – Socioeconomic

Displacement of local communities

Fair resettlement programs should offer alternative housing, land, or financial compensation in line with international standards such as the IFC Performance Standards. Participatory land-use planning must involve local leaders to protect culturally significant sites and uphold community values.

Cultural Erosion

Development should integrate local art, architecture, and storytelling into resort designs—for example, employing Bedouin artisans for décor. Community-led tourism initiatives, such as indigenous-guided tours, can offer authentic experiences while empowering local voices.

Inflation & Cost of Living

Price controls such as subsidies for essential goods or rent caps in nearby towns like Al Wajh to be implemented. Supporting local businesses through grants for small to provide goods and services to the project, such as handicrafts or organic food, fostering inclusive economic growth.