



# **Regenerated & Sustainable Resources (SGI & Vision 2030 Initiatives)**

# Regenerated & Sustainable Resources

Regenerated and Sustainable Resources” refers to the process of **restoring, renewing, and efficiently utilizing natural and biological resources** to maintain environmental balance and economic prosperity. It aims to shift society from a model of consumption and depletion to one of regeneration and sustainability.

Regenerated and sustainable resources differ in their fundamental goals: sustainability focuses on minimizing harm, while regeneration aims to actively restore and improve ecosystems.

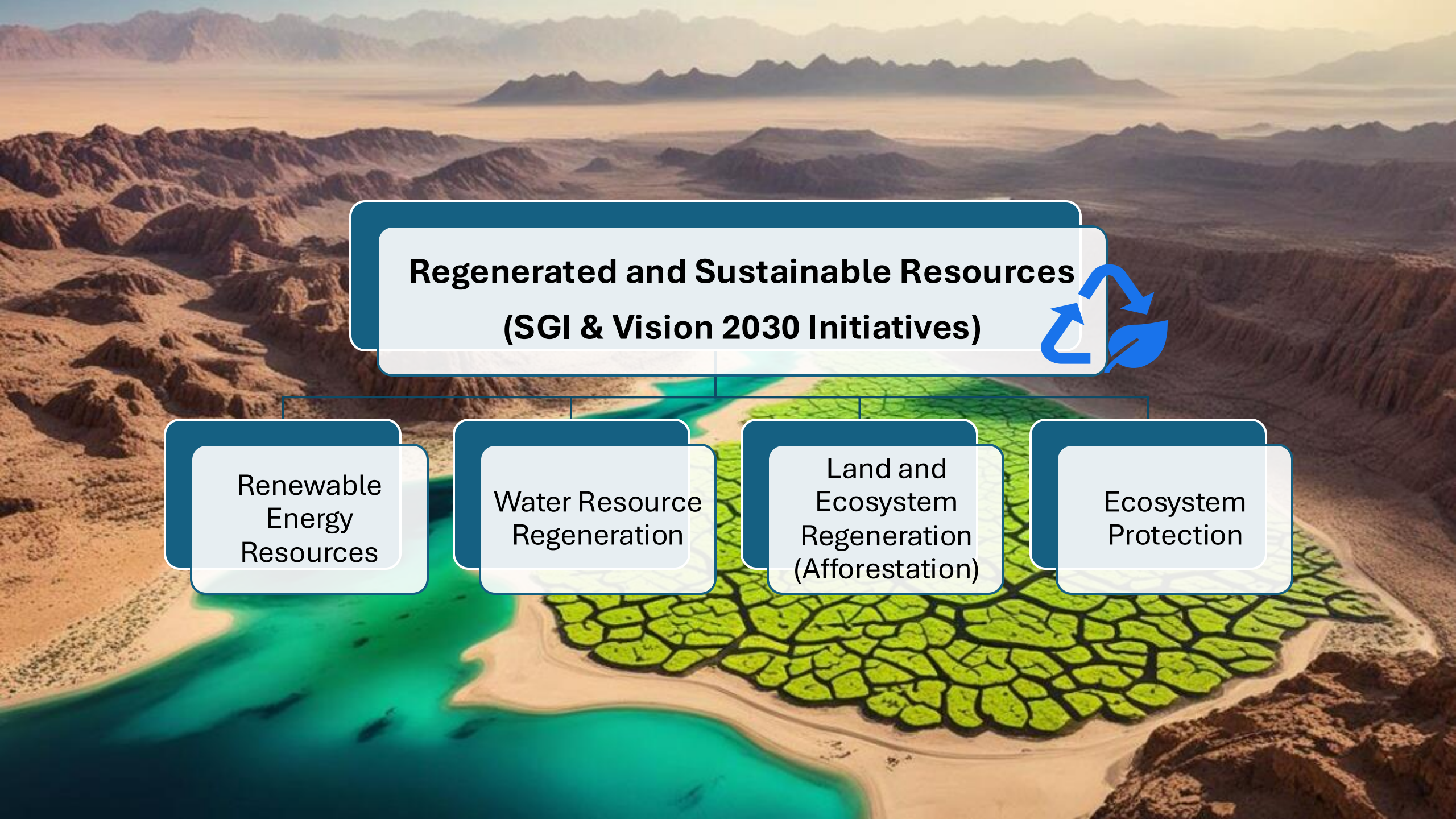


# Key differences between sustainable and regenerative

| Feature  | Sustainable Resources                                                 | Regenerated Resources                                                                                                      |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Primary Goal                                                                              | To maintain current levels and minimize harm.                         | To restore and improve systems for a net-positive impact.                                                                  |
| Approach                                                                                  | "Less bad," focusing on conservation and slowing depletion.           | "More good," focusing on active restoration and revitalization.                                                            |
| Scope                                                                                     | Often focused on resource management within a specific limit.         | A holistic, systems-thinking approach that considers the broader ecosystem.                                                |
| Example mindset                                                                           | A company might use recycled materials to reduce its waste footprint. | A company might not only use recycled materials, but also invest in programs that restore forests to create new materials. |



Sustainability has become a key global priority to ensure the balance between economic development, environmental protection, and social well-being. In Saudi Arabia, this vision has been clearly translated through **Vision 2030** and the **Saudi Green Initiative (SGI)**. Both programs focus on transforming the Kingdom into a model of environmental stewardship, promoting renewable energy, conserving natural resources, and restoring degraded ecosystems for future generations.



## Regenerated and Sustainable Resources (SGI & Vision 2030 Initiatives)



Renewable  
Energy  
Resources

Water Resource  
Regeneration

Land and  
Ecosystem  
Regeneration  
(Afforestation)

Ecosystem  
Protection



## Regenerated & Sustainable Resources (SGI & Vision 2030 Initiatives)

**Saudi Arabia**, traditionally known for its **oil wealth**, is now transforming its resource base to include renewable, regenerative, and sustainable resources under its Vision 2030 and Saudi Green Initiative (SGI).

These ambitious plans aim to transform the nation's economy and environmental footprint through comprehensive programs across **energy, water, afforestation, waste management, and sustainable development.**





An aerial photograph of a city skyline, likely Dubai, during sunset. The sky is a warm orange color, and the city's skyscrapers are silhouetted against it. The foreground shows a dense urban area with many smaller buildings and roads.

# SAUDI GREEN INITIATIVE

Saudi Arabia has activated 85+ initiatives to help reach the three targets under the Saudi Green Initiative and achieve long-lasting positive change. The initiatives range from afforestation and biodiversity protection to emissions reduction and establishing new protected areas. Under SGI, Saudi Arabia is delivering against its aspirations to create a greener future for all and is putting action and investment behind the country's commitment to sustainable development.



# SGI roles and responsibilities: putting sustainability first

TO DELIVER THE KINGDOM OF SAUDI ARABIA'S SUSTAINABILITY GOALS, SGI STRIVES TO:



Oversee and unite all of Saudi Arabia's work to combat climate change under one umbrella, with clearly defined goals.



Combine the efforts of the government and private sector, identifying and supporting opportunities for collaboration and innovation.



Grow the green economy - more than 85 initiatives already launched, representing an investment of over SAR 705 billion.



Accelerate the green transition and be a global leader in the implementation of the Circular Carbon Economy approach.



Improve quality of life and protect the environment for the benefit of future generations in Saudi Arabia.



# Renewable Energy & Clean Power

Saudi Arabia is rapidly shifting its energy mix to rely less on fossil fuels, with a target of generating 50% of its electricity from renewable sources by 2030.

- Solar Energy
- Wind Energy and
- Green Hydrogen Plant



# Solar Energy



Saudi Arabia is rapidly shifting its energy mix to rely less on fossil fuels, with a target of generating 50% of its electricity from renewable sources by 2030, expanding capacity to ~130 GW: ~58.7 GW solar and ~40 GW wind.



According to the Saudi Green Initiative (SGI), the Kingdom has achieved a ~300% increase in installed renewables capacity, and by end 2023 had renewable projects under construction exceeding ~8 GW, with ~13 GW in various development stages.



These efforts help reduce reliance on fossil fuels and lower emissions from power generation (a key pivot given Saudi's traditional role as a major oil & gas producer)







## Solar Energy

- The country is rapidly developing large-scale solar projects. Key installations include the **Sakaka** and **Sudair** solar PV parks, which help power domestic needs and reduce carbon emissions.
- **Sakaka Solar Power Plant:** The first utility-scale solar project in the country, it has a 300 MW capacity and powers 55,000 households.
- **Sudair Solar PV Plant:** This is one of the world's largest single-contracted solar photovoltaic (PV) plants, with a capacity of 1.5 gigawatts (GW). It is expected to power 185,000 homes and significantly reduce carbon emissions.



Sakaka Solar PV Parks



Sudair Solar PV Parks



## Wind Energy

- The Kingdom is also capitalizing on its strong wind resources, particularly along the coast.
- The **Dumat Al-Jandal** wind farm is a 400-megawatt project in **Saudi Arabia's Al-Jouf region**, which is the country's first and the Middle East's largest wind farm.

**DUMAT AL-JANDAL WIND FARM**  
Saudi Arabia's \$500m wind-power project is the largest of its kind in the Middle East



The wind farm will be located 560 miles north of Riyadh in Al-Jouf region



Dumat al-Jandal wind farm





# Green Hydrogen

- **Saudi Arabia** is making a major push into green hydrogen, centered on the **NEOM Green Hydrogen Company (NGHC) project**, one of the world's largest hydrogen-based ammonia production facilities.
- The massive **NEOM Green Hydrogen Plant** is under development to use renewable energy to produce green hydrogen, positioning the Kingdom as a potential global leader in this emerging sector.
- A \$8.4 billion joint venture between NEOM, ACWA Power, and Air Products, the NGHC facility in Oxagon will produce up to 600 tones of green hydrogen per day. This will be converted into 1.2 million tons of green ammonia per year for global export.





# Water Resource Regeneration/Management

**Saudi Arabia's** water resource regeneration efforts, driven by Vision 2030, focus on a multi-pronged strategy that includes;

- wastewater reuse,
- desalination improvements,
- and water demand management.

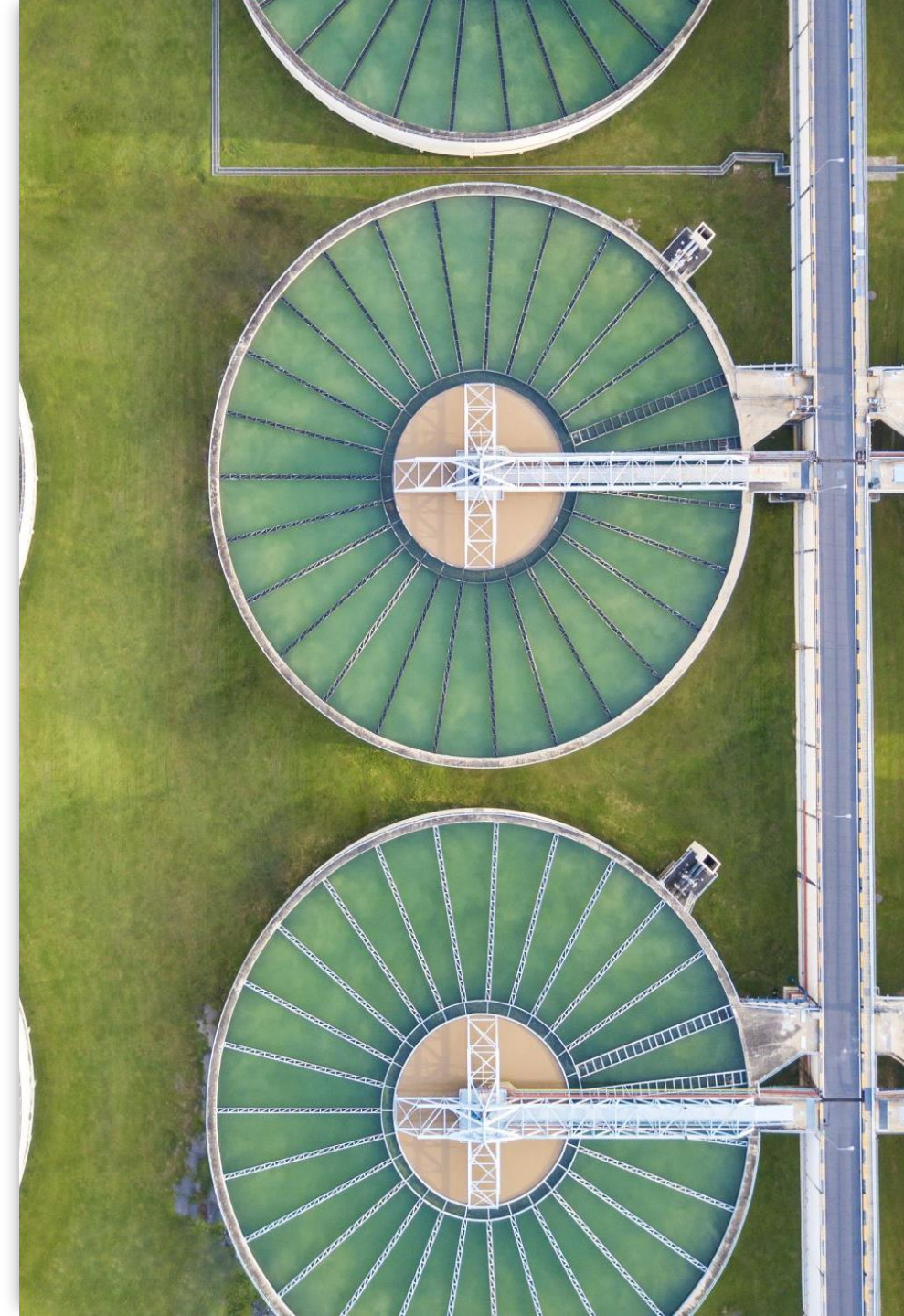
Given the country's arid climate, regeneration is a critical component of national and water security.





# 1. Wastewater Reuse & Treatment

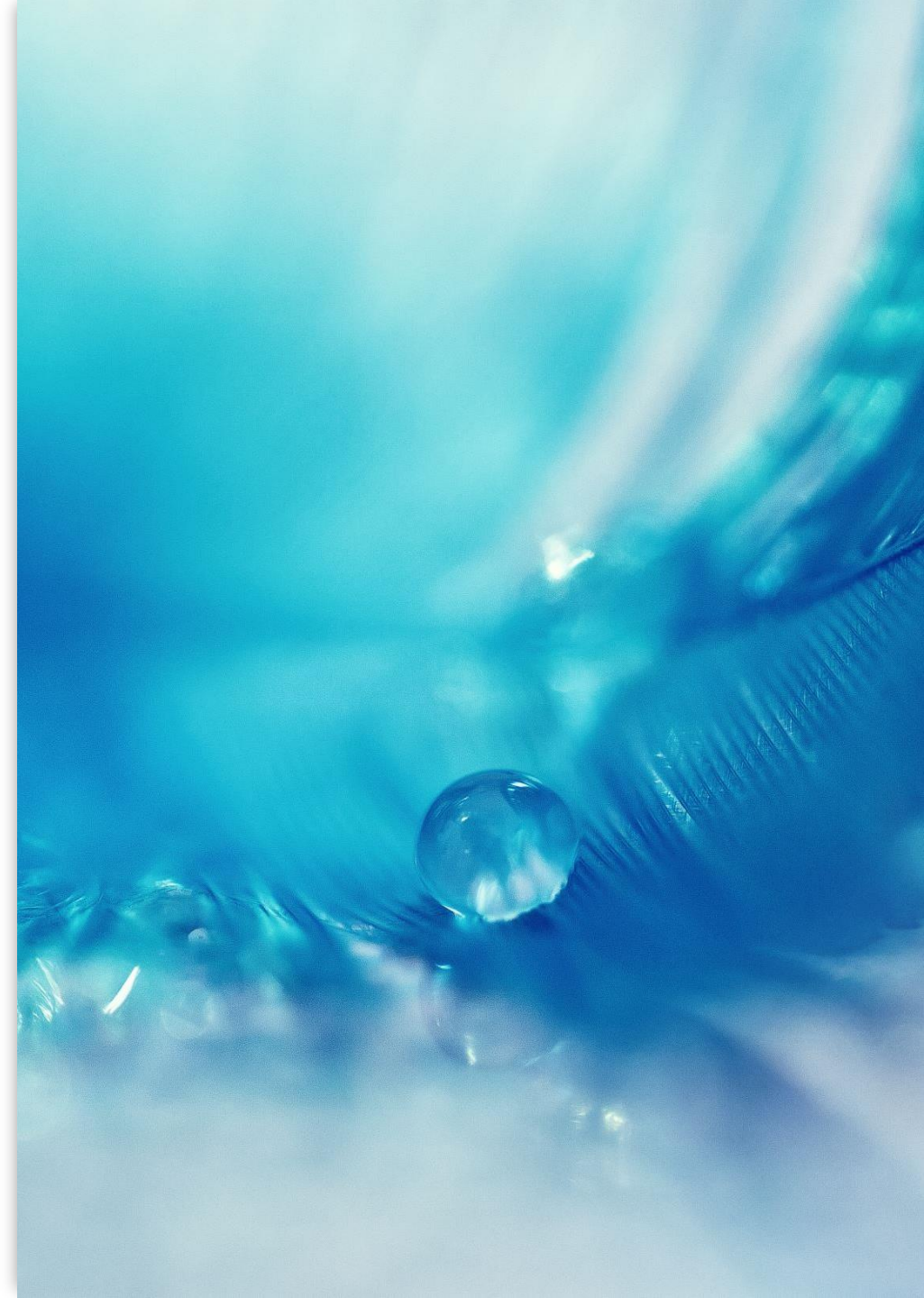
- **The National Water Company (NWC)** operates numerous wastewater treatment plants across the Kingdom, with significant investment continuing for new and upgraded facilities. By 2040, the government plans to increase water reuse to over 90%.
- **King Abdullah University of Science and Technology (KAUST)** has developed portable, containerized wastewater treatment systems, which can service households not connected to central sewage systems. This innovation allows for immediate recycling for local needs like landscaping and horticulture.
- **The SGI** targets reusing 100% of treated wastewater in major cities like **Riyadh for irrigation**, industrial, and agricultural purposes, significantly reducing the reliance on freshwater and desalinated water.





## 2. Water Desalination Advancement

- **Saudi Arabia** is a global leader in water desalination, with advancements focusing on shifting from energy-intensive thermal methods to more efficient reverse osmosis (RO) technology, incorporating renewable energy, and developing innovative solutions for brine treatment and mineral recovery.
- The **Kingdom** has also prioritized localization of technology and private sector partnerships to increase production, improve efficiency, and achieve sustainability goals under **Vision 2030**.





## 2. Water Desalination Advancement

- **Shift to reverse osmosis (RO):** The country is transitioning from traditional thermal evaporation to more energy-efficient and environmentally friendly RO technology to produce desalinated water.
- **Solar-powered desalination:** Projects like the AlKhafji Desalination Plant utilize solar energy to reduce carbon emissions and transition towards sustainable power sources.
- **Research and development:** Organizations like the King Abdullah University of Science and Technology (KAUST) are developing new, low-energy desalination methods that require less pressure and fewer chemicals.



### 3. Water Demand Management & Conservation

**Water demand management and conservation (WDM)** is a strategy to minimize water waste by controlling both the supply and demand for water. The Kingdom is implementing policies to manage water demand across all sectors to ensure the long-term sustainability of its resources.





### 3. Water Demand Management & Conservation

- **Agricultural reforms:** The government has banned the cultivation of water-intensive crops like wheat to curb consumption in the agricultural sector, which uses the majority of the Kingdom's water supply. It also provides incentives for using water-efficient technologies such as hydroponics and drip irrigation.
- **Domestic water conservation:** The "**Qatrah**" program aims to significantly reduce per capita daily water consumption. This includes public awareness campaigns, tiered water pricing, and the distribution of **water-saving appliances**.
- **Water loss reduction:** The National Water Company is actively working to address high rates of water loss from aging distribution networks through leak detection and repair programs.



# SAUDI ARABIA LAUNCHES PROGRAM FOR A DRASTIC REDUCTION IN WATER USE



Qatrah program was launched at the  
**March 17-19 Saudi Water Forum 2019**  
in Riyadh and with World Water Day set for Friday, March 22

Through Qatrah, the ministry aims to reduce  
per capita consumption per day from



## Water security

is a key challenge for Saudi Arabia, which has  
invested heavily in seawater desalination

Saudi Arabia is the world's **third largest**  
consumer of water per capita after the **US and Canada**



In 2016,  
**82%**

of non-renewable water consumption was  
concentrated in the **agricultural sector**

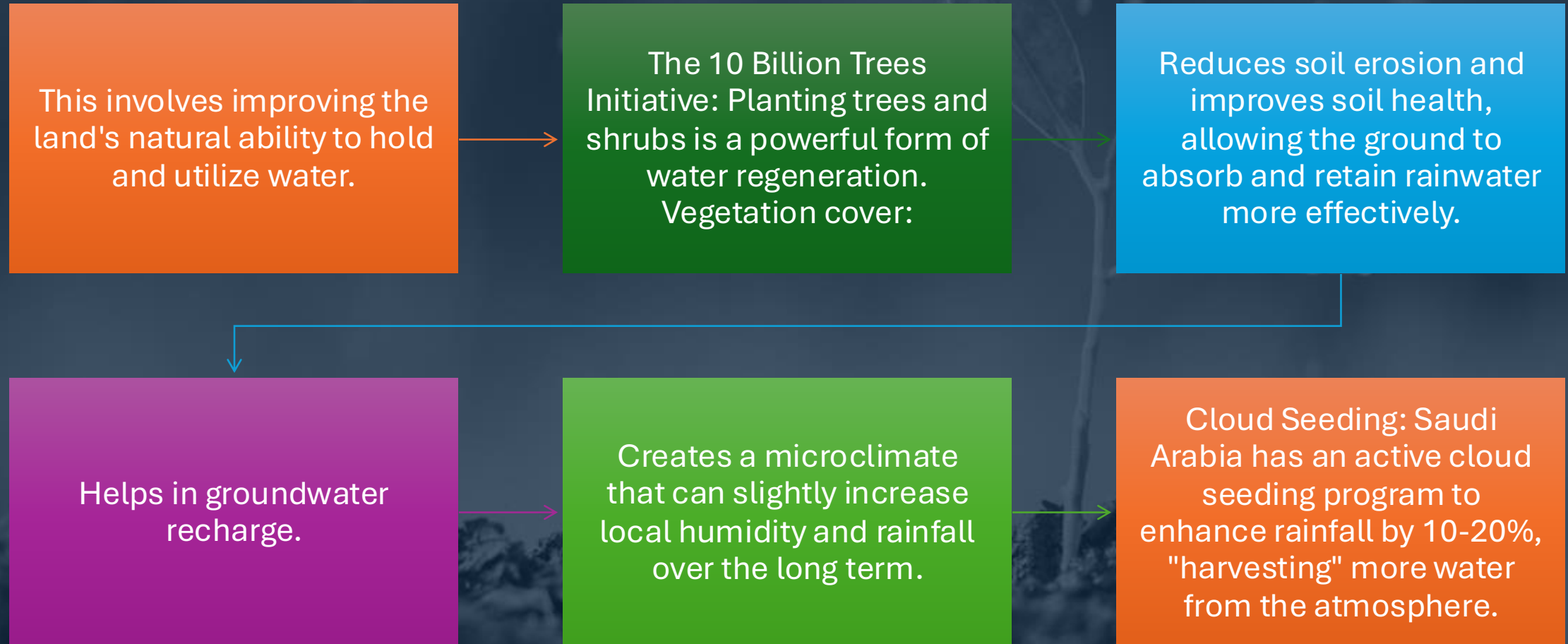
“ The reality of the water sector in the Kingdom  
requires all of us to work together -- the public  
sector, the private sector and the citizenry -- with  
the aim of developing techniques for the  
production and distribution of water at the lowest  
possible cost, ”

**Minister of Environment, Water and Agriculture**  
**Abdulrahman Al Fadley**





## 4. Natural Asset Regeneration: Combating Desertification



# **Environmental Protection - Afforestation & Conservation**

Environmental protection refers to the preservation, restoration, and sustainable management of natural resources.

In arid and semi-arid countries like Saudi Arabia, environmental challenges such as desertification, water scarcity, and loss of biodiversity make afforestation and conservation critical strategies for promoting regenerated resources - resources that can renew themselves over time through sustainable management.





# Afforestation and Reforestation Initiatives

**Afforestation and reforestation** are among the most crucial strategies for mitigating environmental degradation and promoting the regeneration of natural resources in **Saudi Arabia**. These initiatives aim to combat desertification, reduce carbon emissions, restore degraded ecosystems, and enhance biodiversity in one of the world's most arid regions.



**Afforestation** refers to the process of establishing forests in areas that have not previously been forested.

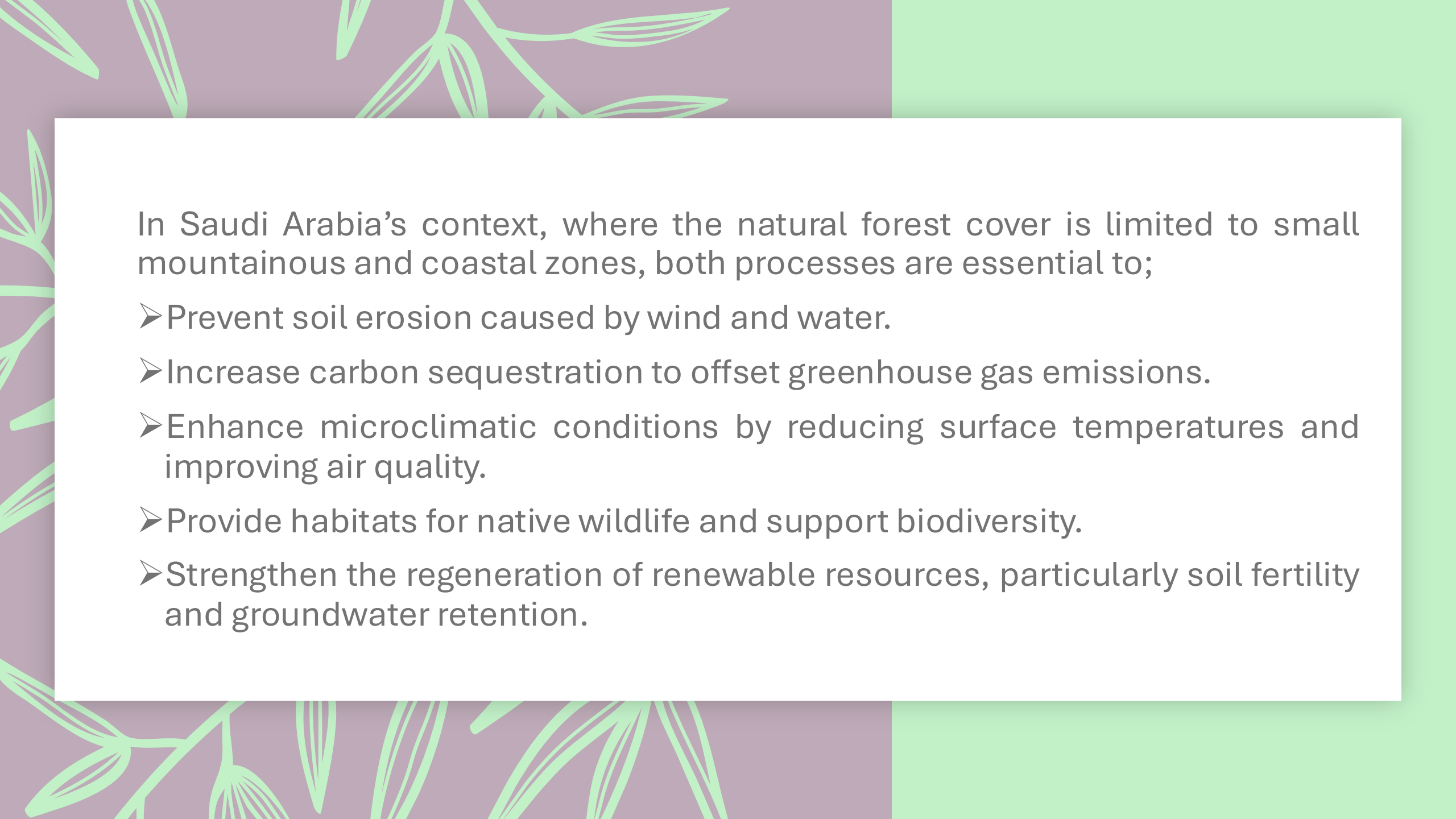
**Reforestation** involves replanting trees in areas where forests have been destroyed or degraded.

In Saudi Arabia's context, where the natural forest cover is limited to small mountainous and coastal zones, both processes are essential to;

- Prevent soil erosion caused by wind and water.
- Increase carbon sequestration to offset greenhouse gas emissions.
- Enhance microclimatic conditions by reducing surface temperatures and improving air quality.
- Provide habitats for native wildlife and support biodiversity.
- Strengthen the regeneration of renewable resources, particularly soil fertility and groundwater retention.







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**The Saudi Green Initiative (SGI): A Vision 2030 Pillar for a Green Future**

Launched in 2021 under the framework of Vision 2030, the Saudi Green Initiative (SGI) represents the cornerstone of the Kingdom's afforestation policy. It embodies a long-term vision to transform Saudi Arabia's environmental landscape and mitigate the effects of climate change.



A comprehensive framework is steering implementation to ensure that the 10 billion trees target is reached sustainably. Tree planting initiatives will be implemented over several years, with more than 600 million trees and shrubs expected to be planted by 2030. This will not only protect the environment but also create new employment and entrepreneurship opportunities for citizens and residents in Saudi Arabia.

**SAUDI GREEN INITIATIVE – PLANTING  
TREES**



# Key Objectives of SGI

- Planting 10 Billion Trees:
- The initiative aims to plant over 10 billion trees across the Kingdom during the coming decades, which would increase vegetation cover by more than 12 times the current level.
- Restoration of Degraded Land: Approximately 40 million hectares of degraded land are to be rehabilitated through native plant reintroduction and soil stabilization programs.
- Regional Collaboration: The SGI complements the Middle East Green Initiative (MGI), which targets the planting of 50 billion trees across the Middle East-one of the largest reforestation programs in the world.



## SGI Impact Goals:

1

Reduce carbon emissions by 4% of global levels.

2

Enhance the resilience of ecosystems and protect wildlife habitats.

3

Create sustainable green jobs and promote ecotourism.

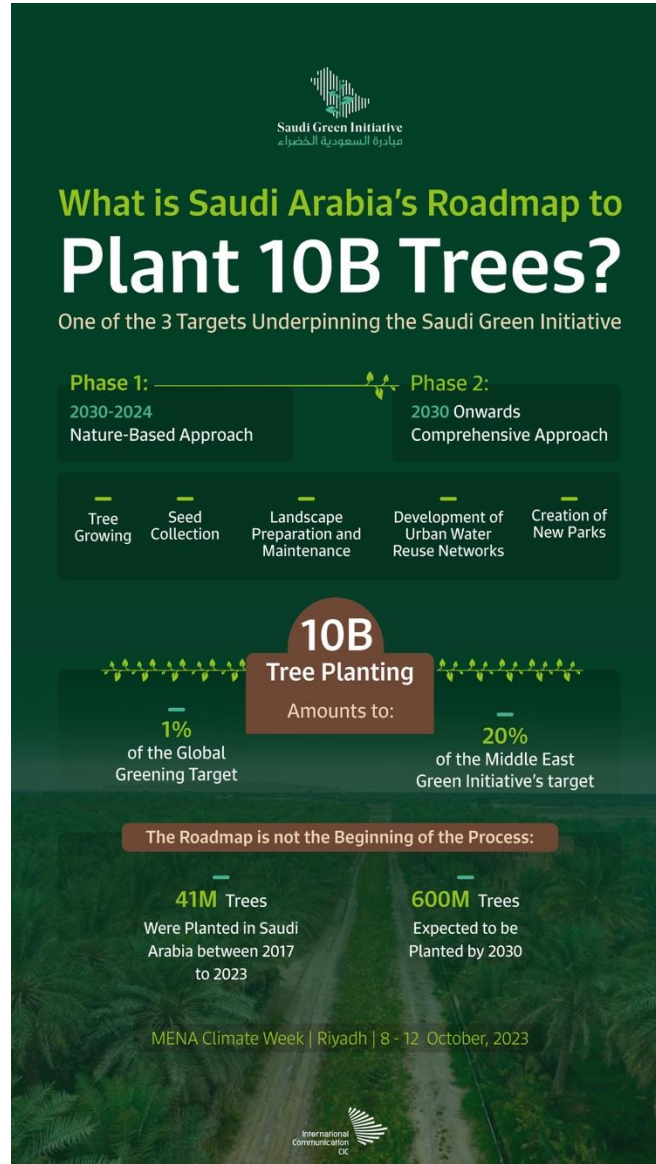
# SAUDI GREEN INITIATIVE – PLANTING TREES



The figure highlights Saudi Arabia's ambitious Vision 2030 plan to restore vegetation by scaling up localized tree-planting efforts across deserts and urban areas. The [Saudi Green Initiative \(SGI\)](#) includes a goal to plant **10 billion trees** across the Kingdom to combat desertification and climate change. More than 600 million trees and shrubs are expected to be planted by 2030.

Initiatives under the SGI, such as the Green Riyadh project and the Eastern Province afforestation program, plus Asir, Madinah, Tabuk, and northern regions aim to increase vegetation cover, reduce carbon emissions, and improve quality of life through sustainable urban and rural greening efforts.





# Role of the National Center for Vegetation Cover and Combating Desertification (NCVC)



The NCVC, established by the Saudi Ministry of Environment, Water, and Agriculture, is responsible for implementing most afforestation programs in the country. Its mandate includes:



Restoring vegetation cover in rangelands, mountains, valleys, and urban areas.



Combating desertification by stabilizing sand dunes and restoring degraded soils.



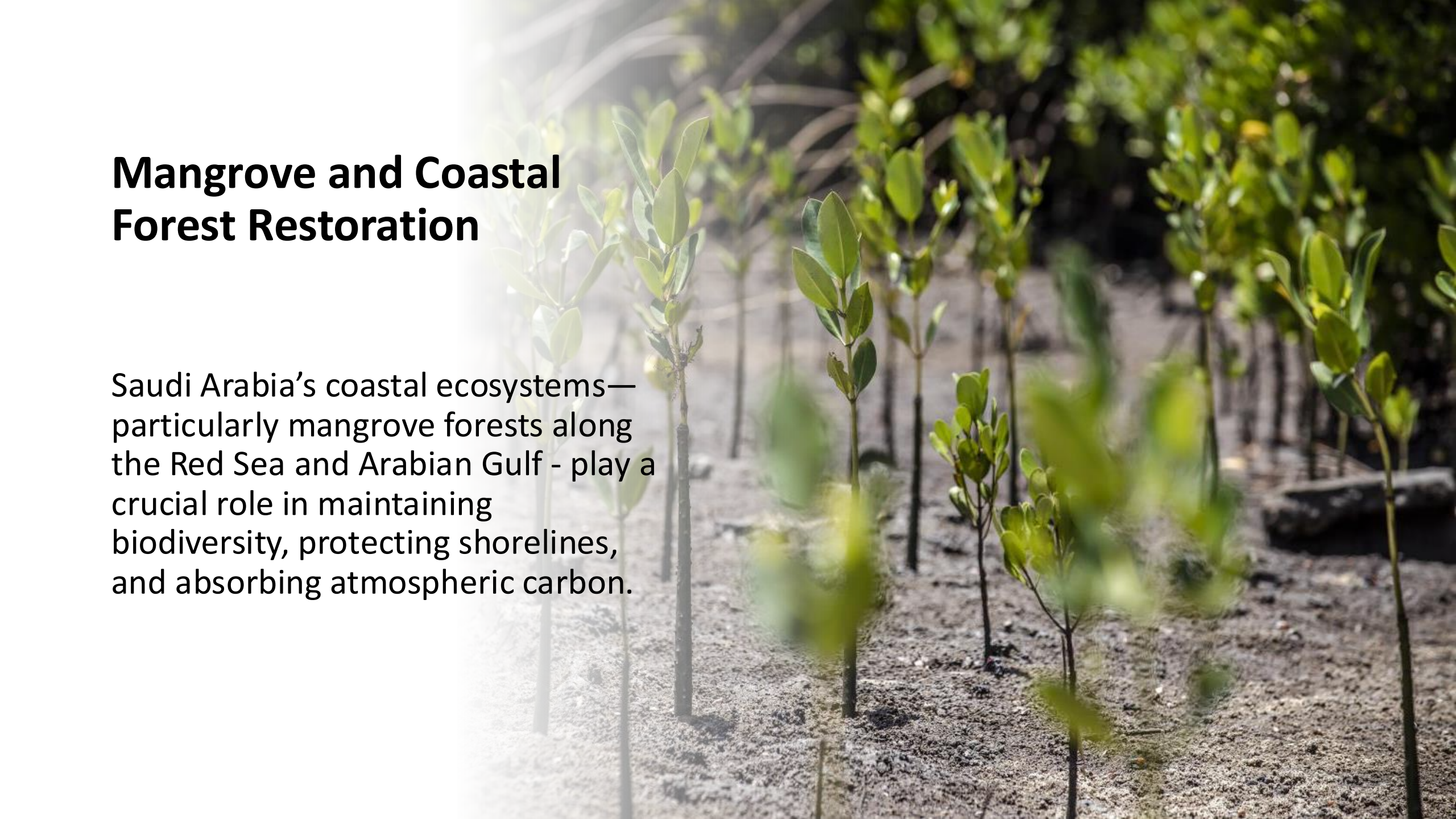
Regulating tree planting efforts to ensure that native and drought-resistant species are prioritized over non-native varieties.



## **Notable NCVC Projects:**

- ❖ Green Riyadh Project: Part of the larger Riyadh Urban Sustainability Plan, aiming to plant 7.5 million trees in the capital city alone, transforming it into one of the world's most sustainable urban areas.
- ❖ Green Jeddah and Green Makkah Initiatives: Focus on urban afforestation to reduce heat islands, improve air quality, and beautify cityscapes.
- ❖ Rangeland Rehabilitation Programs: Restore grazing areas degraded by overuse, protecting them through rotational grazing and re-seeding with native flora.

# Mangrove and Coastal Forest Restoration

A photograph showing a row of young mangrove saplings planted in a sandy area. The saplings are small, with green leaves and thin stems. They are planted in a line, and the background is blurred, showing more trees and foliage. The lighting is bright, suggesting a sunny day.

Saudi Arabia's coastal ecosystems—particularly mangrove forests along the Red Sea and Arabian Gulf - play a crucial role in maintaining biodiversity, protecting shorelines, and absorbing atmospheric carbon.



# Key Projects

- The National Mangrove Restoration Program aims to rehabilitate 100 million mangrove trees by 2030.
- Collaborations with environmental NGOs and international organizations, such as the UNEP and Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA), focus on replanting and conserving native mangrove species (*Avicennia marina*).
- Mangrove restoration enhances fish breeding grounds, supports coral reef ecosystems, and strengthens coastal resilience against erosion and sea-level rise.





# Summary

Saudi Arabia's afforestation and reforestation initiatives mark a transformative shift toward environmental sustainability in one of the most challenging climates on Earth. Through large-scale tree planting, rehabilitation of degraded lands, coastal forest restoration, and public engagement, the Kingdom is setting a global example of how strategic greening can drive environmental regeneration, climate resilience, and sustainable development.

