

CLIMATE CHANGE

ON NATIONAL & GLOBAL PERSPECTIVES

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First Form

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<https://forms.gle/sKoiL2ksBBXFfeoj9>

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Causes, Consequences
and Solutions
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GLIMPSE OF CONSEQUENCES





About

- Climate Change, as defined by the United Nations, involves long-term changes in temperatures and weather patterns.
 - While these changes can occur naturally, human activities, especially since the 1800s, have become the primary cause, mainly constituting burning fossil fuels.
-

03

Climate Change Globally

Main causes and
consequences of
climate change
affecting all countries



Global: Facts On Climate Change

1



2



3



4

**421 parts
per million**

Is the **concentration of CO2** in our atmosphere, as of May 2022, is the highest it has been in the last 2 million years.

**The Year
2023**

Was the **hottest year ever** recorded, including the last decade as the hottest in the last 125,000 years.

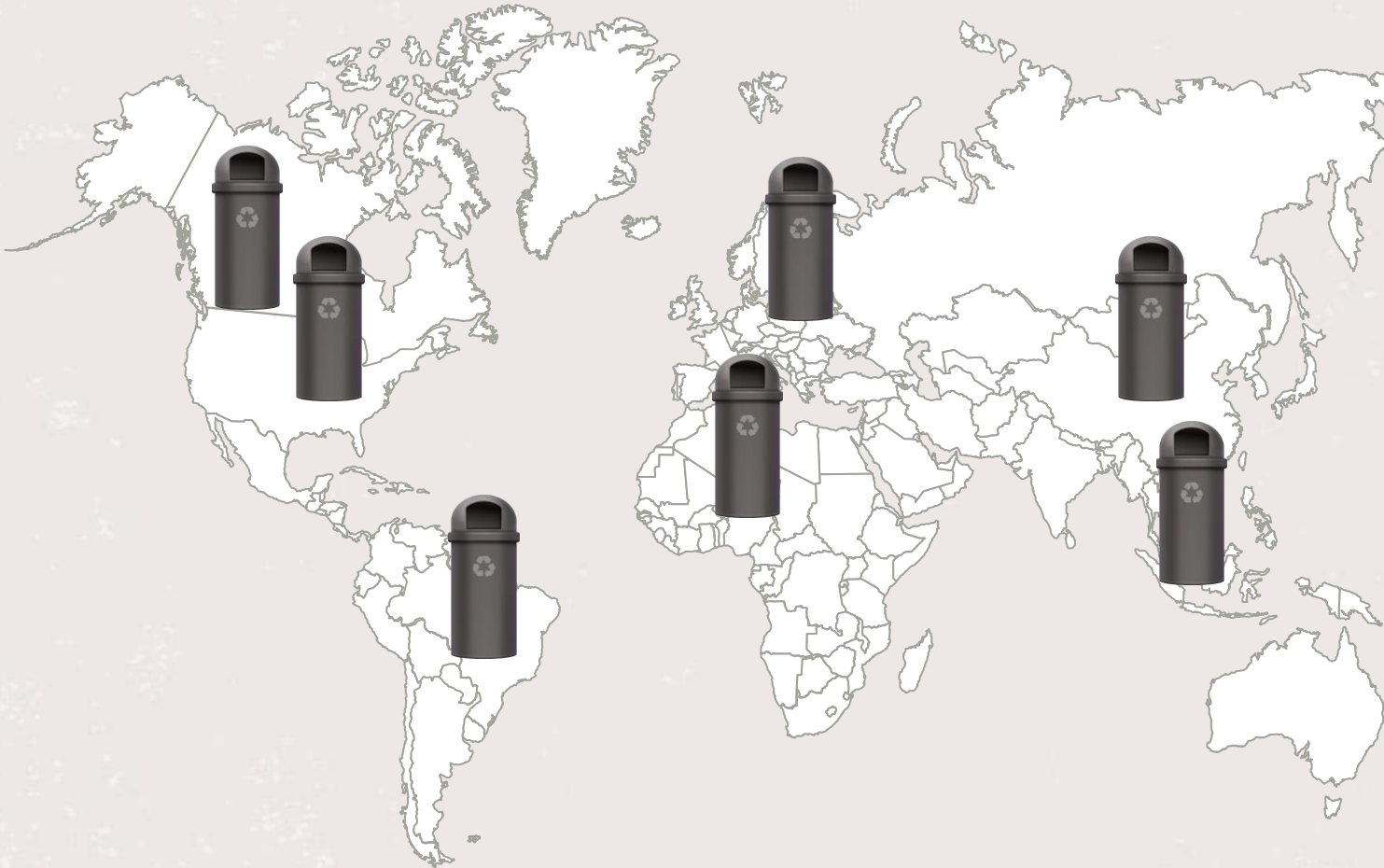
**3.6
Billion**

Is the number of people **who live in areas highly vulnerable** to climate change impacts like droughts and floods .

**1.2 Trillion
Tons**

Is the **mass of ice lost** every year ,which is around the mass of all living things on Earth. Since the mid-1990s, we've lost around 28 trillion tons of ice.

Fact on Climate Change



302.4 Billion
Work Hours

lost due to
excessive heat in
2019

Global Causes



Electricity

Most electricity is produced by **burning fossil fuels**, which **releases greenhouse gases** like carbon dioxide and nitrous oxide, contributing significantly to global emissions.



Deforestation

Cutting down forests for agriculture or other purposes releases stored carbon and reduces the Earth's ability to absorb carbon dioxide, increasing global emissions.



Transport

The use of **fossil fuels in vehicles, ships, and planes** contributes a significant portion of global carbon dioxide emissions, especially from things like road transport.

Manufacturing Goods

The manufacturing industry, which relies heavily on **fossil fuels**, actually generates emissions during the production of goods such as cement, steel, and plastics, making it a major source of **greenhouse** gases.

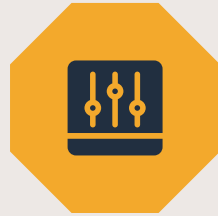
Food Production

Agriculture and food production also release greenhouse gases through deforestation, animal digestion, and the use of fertilisers and machinery powered by **fossil fuels**.

Building Energy Use

Residential and **commercial buildings** consume large amounts of electricity, mostly from fossil fuels, leading to substantial greenhouse gas emissions from **heating, cooling, and powering appliances**.

Global Consequences



Heat Waves

Global temperatures have been consistently rising, with the last decade being the hottest in the last 125,000 years. This increase leads to more frequent heatwaves, heat-related illnesses, and escalates the risk of wildfires, which particularly vulnerable places like the Arctic, which is warming at an accelerated rate.

Intensified Storms

As global temperatures rise, storms are becoming more frequent and severe too. Warmer oceans provide more energy for cyclones, hurricanes, and typhoons, leading to destructive storms that devastate communities and cause significant economic losses for countries, all around the world.



Global Consequences



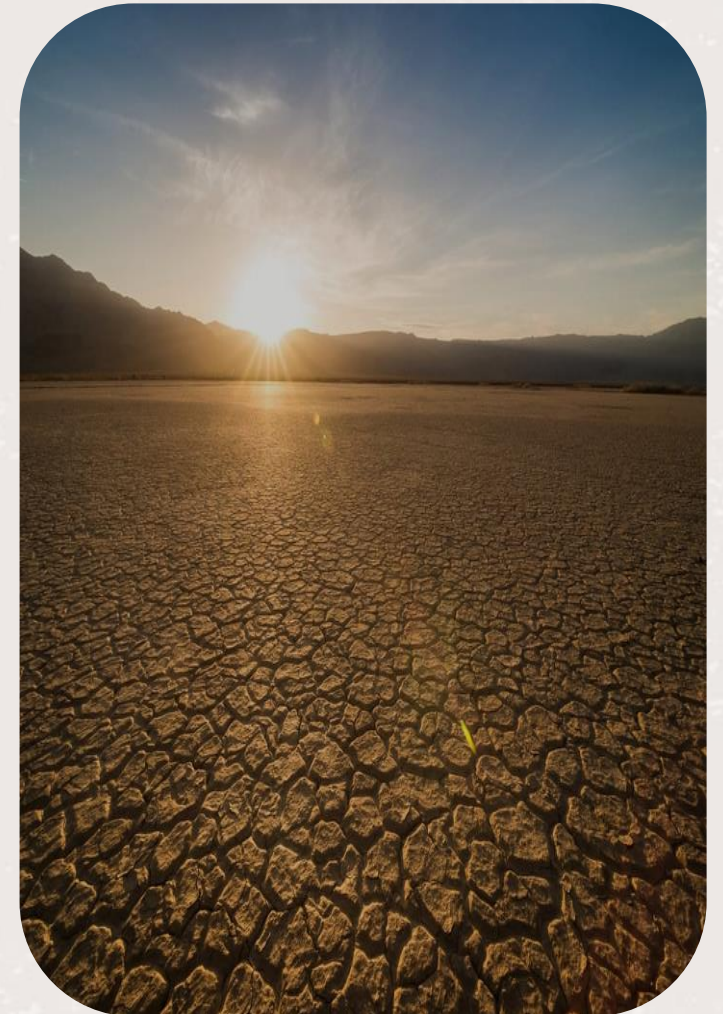
Sea Levels

The ocean actually absorbs most of the heat from global warming, causing its volume to expand and sea levels to rise due to both thermal expansion and melting ice sheets. This threatens coastal communities and also increases ocean acidity, endangering marine life and coral reefs.

Accelerated Extinction



Climate change is significantly accelerating the extinction rate of species, both on land and in the ocean. Rising temperatures, habitat destruction, and extreme weather events are contributing to a loss of biodiversity, putting one million species at risk of extinction in the coming decades.





لَا إِلَهَ إِلَّا اللَّهُ مُحَمَّدٌ رَسُولُ اللَّهِ

National perspective:

Saudi Arabia

& Climate Change

Causes and Consequences of
Climate Change in Saudi Arabia
and possible **Solutions**

Local Issue

Climate change presents urgent challenges for Saudi Arabia, impacting agriculture, water resources, and coastal areas. If high-emission trends continue, the country will actually face **severe droughts, extended heatwaves, and coastal erosion**. Rising sea temperatures could reduce fish stocks by **even 30%**, while water scarcity will strain agriculture. Urgent action on low-carbon strategies is really needed to mitigate these effects and protect the economy and public health.



Saudi Arabia : Facts

1



2



3



4

International Climate Partnerships

Saudi Arabia endorsed the **Paris Agreement in November 2016**, which commits nations to collective efforts to mitigate climate change effects.

13th Biggest Emitter

Saudi Arabia is the **13th biggest emitter among the G20 countries**. Immediate political measures are crucial in Saudi Arabia to ensure a sustainable, low-carbon future.

World's Largest Oil Exporter

Saudi Arabia is the **world's largest oil exporter**, followed by Russia and Canada.

Oil Economy

The Saudi economy heavily depends on its petroleum industry, with oil contributing around **40% to the nation's GDP and 75% to its fiscal revenue** in recent years. This reliance on fossil fuels is a significant factor in the country's carbon emissions, driving climate change concerns.

Saudi Arabia : Causes



Heavy Fuel Reliance

In Saudi Arabia, heavy fuel consumption, especially from **transportation and industry**, is a major source of carbon emissions. This contributes to global warming and intensifies local environmental challenges.



Urban Sprawl

Urban sprawl in Saudi Arabia leads to the expansion of cities into natural areas, **increasing land use and environmental degradation**. It also heightens energy demand and worsens air pollution.



Deforestation

Deforestation in Saudi Arabia, mainly due to agriculture and development, **reduces the ability of forests to absorb carbon dioxide**. This loss of trees further exacerbates the country's climate-related issues.

Saudi Arabia: Consequences

Agricultural Droughts

By 2050, Saudi Arabia may see an 88% rise in the frequency of agricultural droughts if current high-emission trends continue, and that will continue impacting crop yields and food security.

Longer Heatwaves

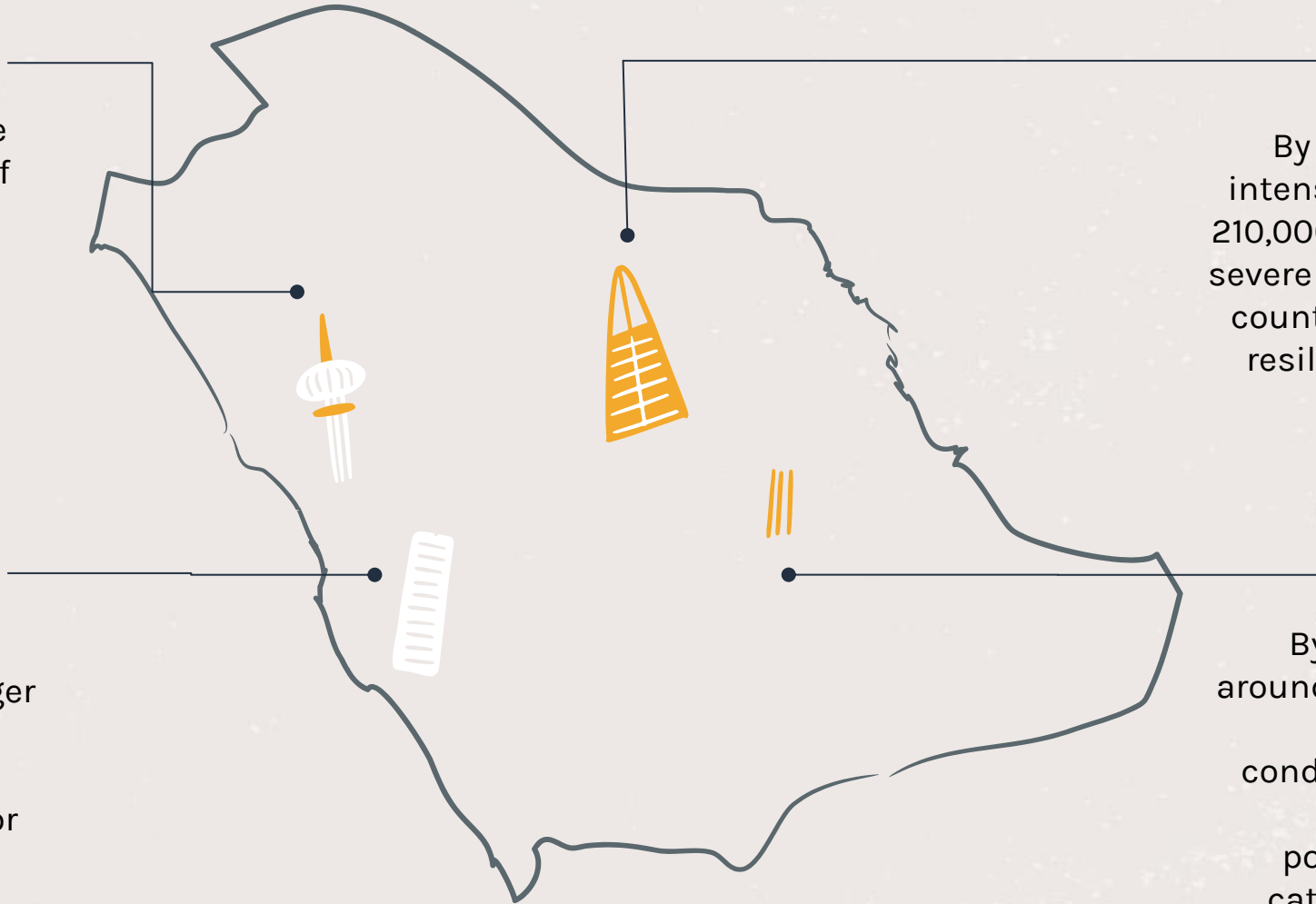
Heatwaves in Saudi Arabia could last over 4,000% longer by 2050 under a high-emission scenario, leading to increased health risks for its people and strain on infrastructure.

Coastal Flooding

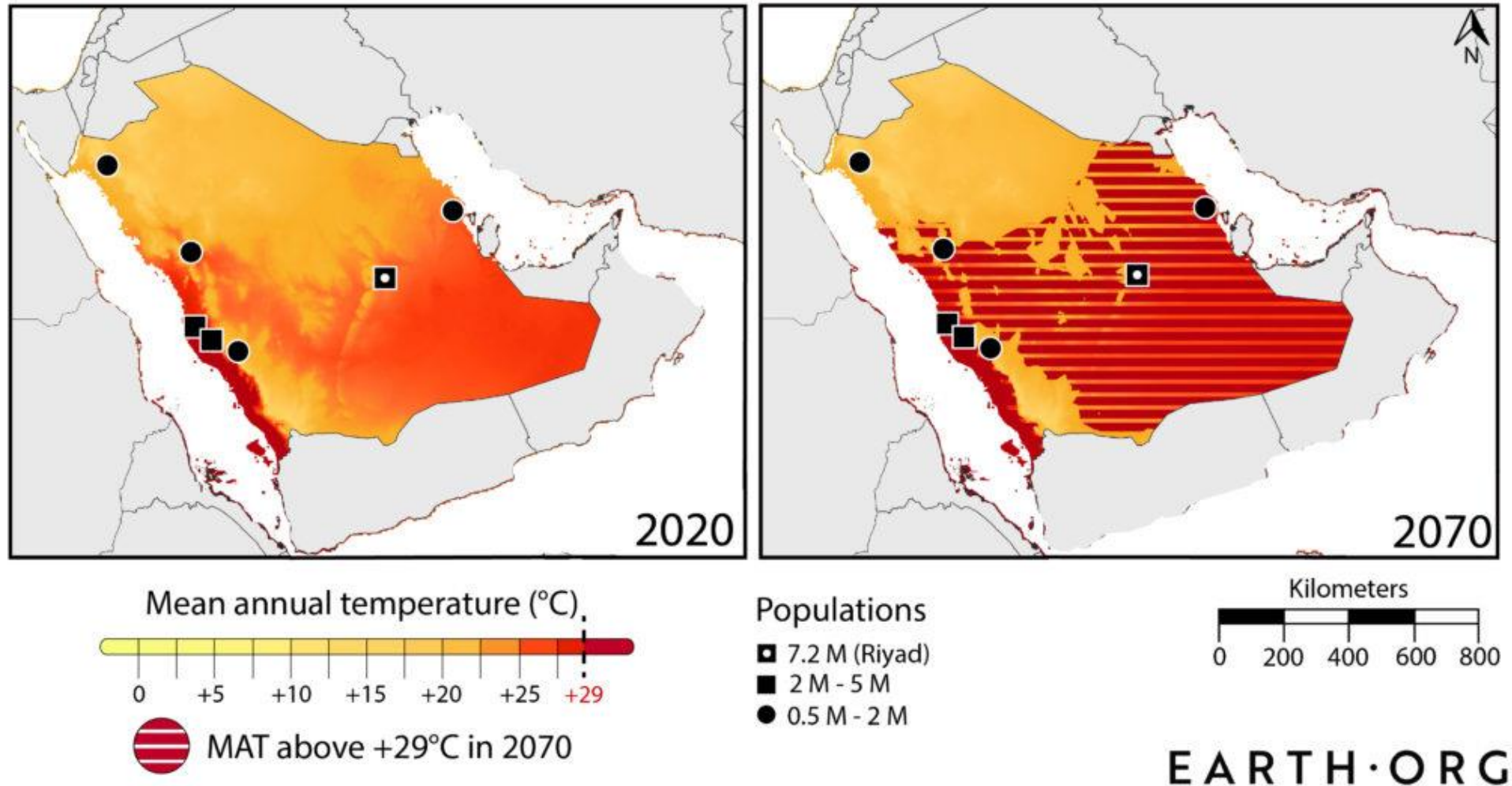
By 2050, rising sea levels and intensified storms could expose 210,000 people in Saudi Arabia to severe flooding, particularly if the country does not adopt climate-resilient coastal infrastructure.

Fish Catch

By 2050, ocean temperatures around Saudi Arabia could rise by 1.6°C under high-carbon conditions, leading to increased ocean acidification and a possible 30% decrease in fish catch potential, affecting local fisheries and food supplies.



Saudi Arabia: Consequences



Earth.org: "Nineteen of the twenty hottest years on record have occurred since 2001, not including 2020 which is on track to top the list. Now, research has found that Saudi Arabia could become too hot to live in by 2070." Due to climate change.



Water Scarcity

Longer droughts and rising sea levels are expected to diminish water resources in Saudi Arabia, potentially increasing water demand for agriculture by up to **34.2% by 2050**, even under low-carbon conditions.



Global perspective: **Costa Rica** & Climate Change

Consequences of Climate Change in
Costa Rica and implemented **Solutions**

Costa Rica: Causes



Slash & Burn Agriculture

This cultural practice involves clearing land by cutting and burning vegetation, which releases greenhouse gases and contributes to deforestation, worsening climate change. While it has been used for generations, it is highly unsustainable in densely populated areas.

Burning Trash

Despite being outlawed since 2010, the burning of trash continues in Costa Rica. This practice releases pollutants and greenhouse gases into the atmosphere, contributing to air pollution and climate change. Each garbage fire, although small, collectively adds to the environmental damage over time.

Costa Rica: Consequences



Urbanisation

The increase in concrete and building construction contributes to warming by retaining heat.

CAUSES



"Heat" Islands

The development of urban areas leads to heat islands, where temperatures rise due to less green space that would otherwise absorb heat.

Costa Rica: Consequences

Temperature Rise

Costa Rica has experienced a significant temperature increase of **0.2 to 0.3°C per decade** since 1961, leading to prolonged and hotter dry seasons.

Extreme Weather

There has been a notable increase in extreme weather events, with a **2.5% rise in warm days** and a significant **increase in intense rainfall** due to warmer Atlantic Ocean temperatures.

Agricultural Stress

The strengthening of the hydrological (water) cycle, characterized by more intense and shorter rainy periods, is putting stress on agriculture, soil, forests, and water resources, making them more vulnerable to **droughts and floods**.

Costa Rica: Consequences



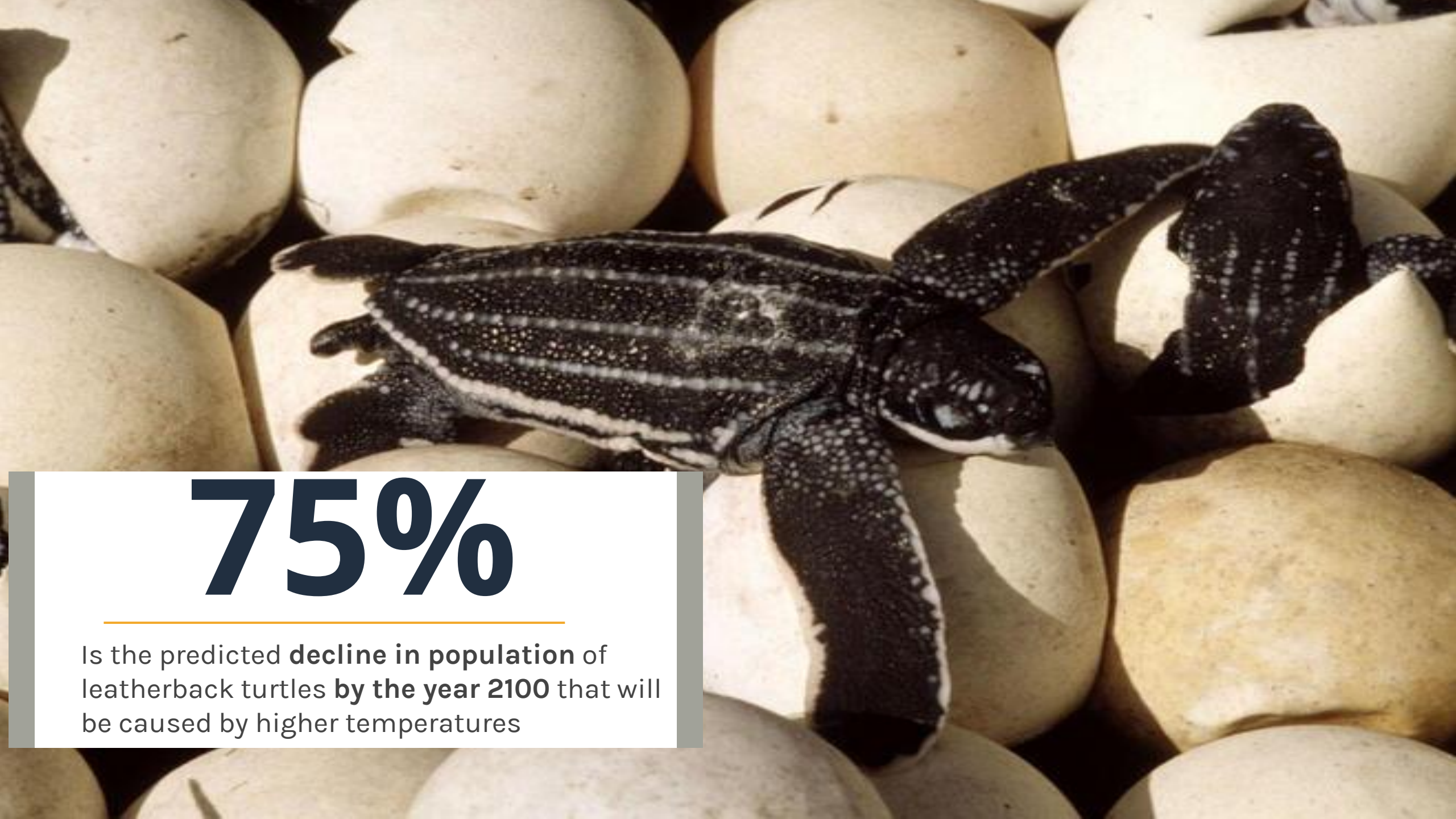
Turtles



Leatherback sea turtles in Costa Rica are facing great threats due to climate change.

Climate change results in rising sea levels, higher temperatures and changes in migration and eating habits. And all these factors lead to significant decrease in hatchlings and nests; since not only does rising tides reduce shoreline area for nests, and now increase risk of erosion, but also increase in temperatures cause heating of sand that harms the eggs; hence, there is great decline in number of leatherback turtles at Playa Grande, from about **1,340 nesting female per season to about only 130-140 per year.**

Also, experts predict that populations will **shrink by at least 7% per decade**, if climate change persists.

A close-up photograph of a leatherback turtle resting on a nest of white, oval-shaped eggs. The turtle's dark, textured carapace and flippers are visible, contrasting with the smooth, light-colored eggs. The turtle is positioned in the center-right of the frame, facing right.

75%

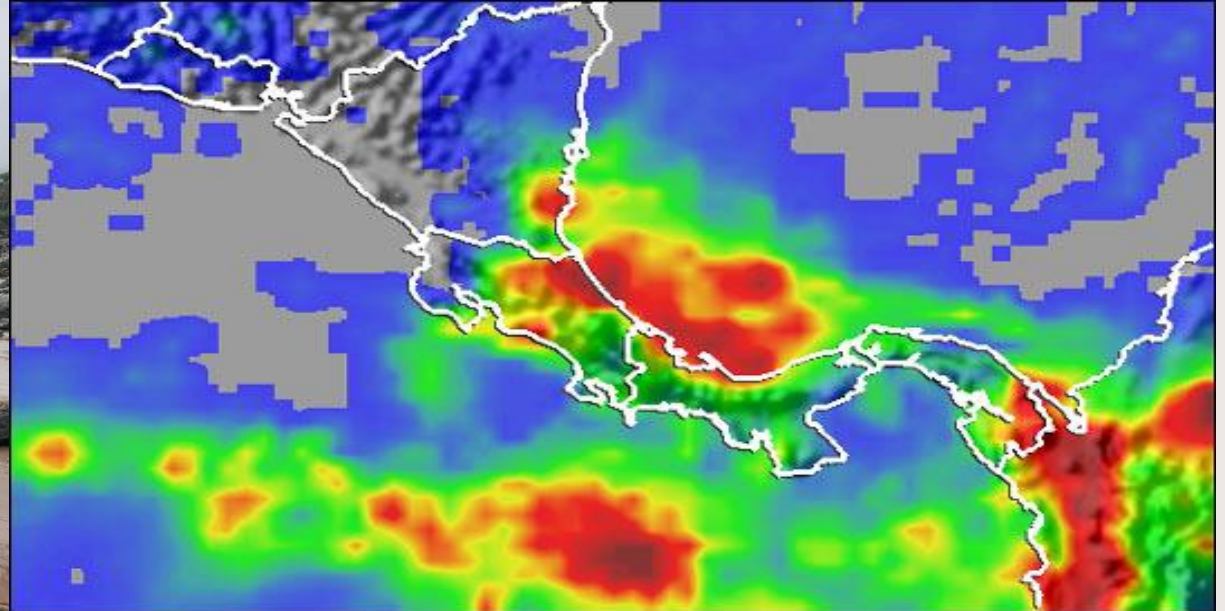
Is the predicted **decline in population** of leatherback turtles **by the year 2100** that will be caused by higher temperatures

Costa Rica: Consequences

Floods



FloodList: "Costa Rica – Floods Leave 2 Dead, 2 Missing, Thousands Displaced"



May 6-11, 2004



NASA Earth Observatory: "Heavy Rains Flood Costa Rica"



The Watchers: "Severe floods hit Costa Rica"

Drought

Costa Rica: Consequences



France 24: "Costa Rica to ration electricity as drought bites"



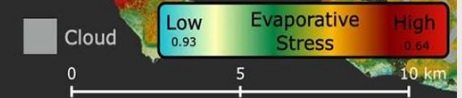
The Tico Times: "El Niño Impacts Loom Large As Costa Rica Faces Drought"

Scene: 03485
Date: February 15, 2019



Pacific Ocean

Liberia



Jet propulsion Laboratory,CIT: NASA Gauges Plant Stress in Costa Rican Drought

“Over the past 5 years, Costa Rica experienced the most severe drought in the last 75 years”

Yamileth Astorga, President of the Costa Rican authority responsible for water supply and sanitation , on the occasion of The 5th Water Dialogues event , 2019.
For the *Smart Water Magazine*.



Global Perspective: Costa Rica- Solutions

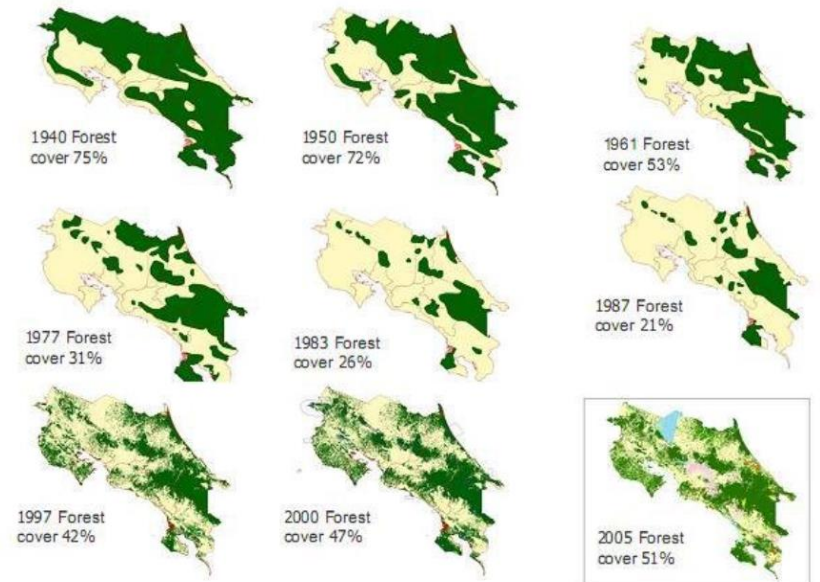
Taxes on causes. Since 1997, Costa Rica has levied a 3.5% tax on fossil fuels, raising around \$26.5 million annually. Revenue from this levy is transferred to the National Forest Fund (**FONAFIFO**), which supports different programs aimed at conserving forests and fostering regeneration.

Incentives for land owners. Costa Rica reversed its deforestation crisis, where it had the **world's highest deforestation rates**, according to Stewart Maginnis, global director of the nature-based solutions group at (IUCN), through key policies including the Payment for Environmental Services (PES) program, which is executed by the FONAFIFO, which financially incentivizes landowners to conserve and restore forests. The government also enforced **strict regulations against illegal land clearing**.

Results of the solution : These measures were successful in raising the percentage of forest cover from **about 25%** in the 1990s to **over 53%** by 2012.



Forest Cover Loss and Recovery



Forest cover and loss in Costa Rica (Source: Hector, 2008)



Global Perspective: Costa Rica- Solutions



Ecotourism .Since ecotourism encourages low-impact activities and reduces human footprint on fragile ecosystems, it has been a key component of Costa Rica's environmental conservation efforts.



Relying on renewable energy to power its electricity. In 2018, approximately **98.53%** of Costa Rica's total energy output came from renewable sources.



Incentives for its citizens to use renewable energy. In May 2022, the government has extended benefits for Electric Vehicles, including secondhand automobiles, until 2035.

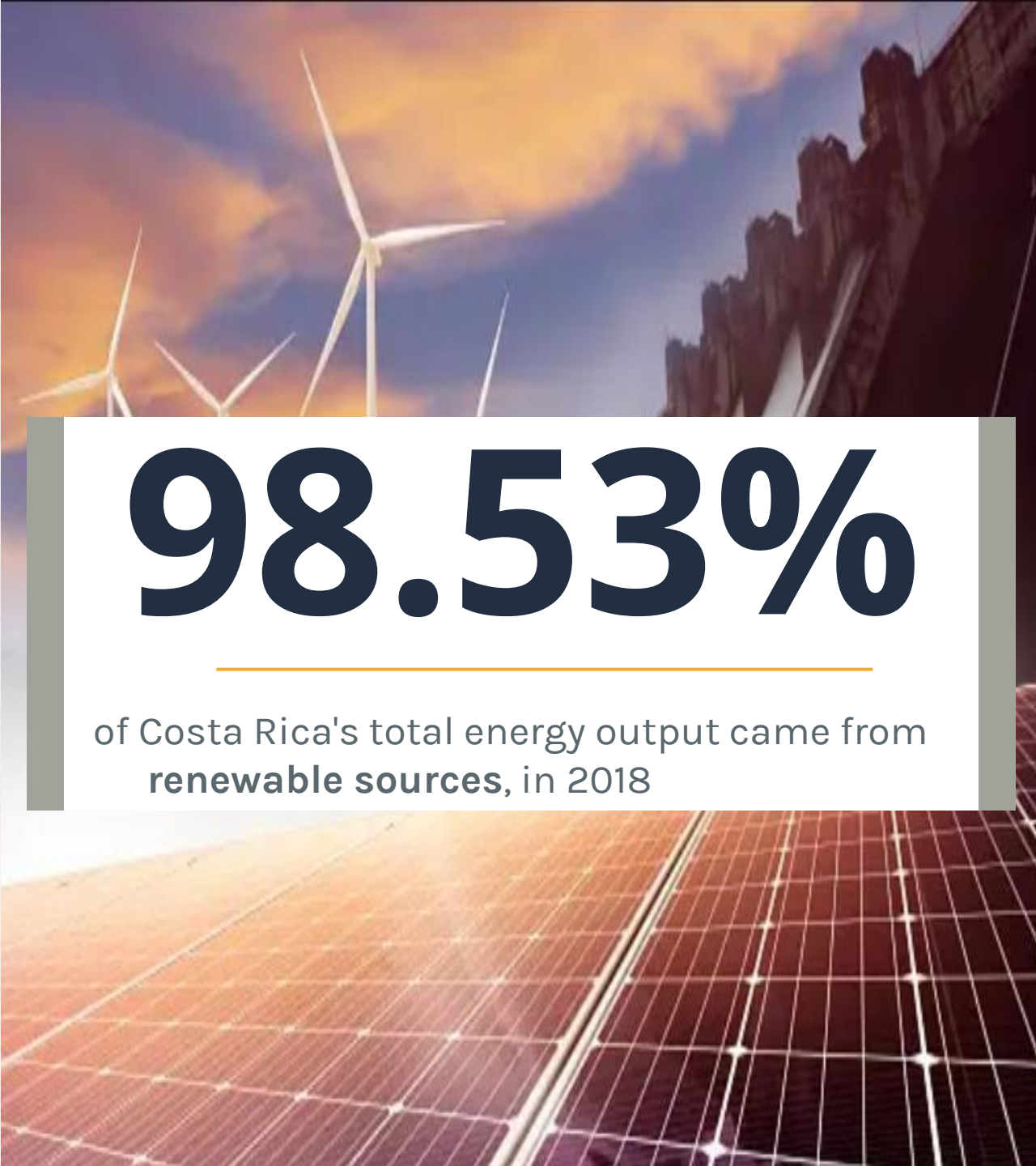


Global Perspective: Costa Rica- Solutions

"Pay to Throw" program

Between 2015 and 2017, Costa Rica's recycling rate saw a remarkable increase of **469%**, according to the Ministry of Health. This progress is largely attributed to the country's "pay to throw" program, which charges residents based on the amount of waste they produce. While challenges in waste management remain, these numbers indicate that Costa Rica is making significant strides in the right direction.



The background of the left panel is a composite image. The top half shows several white wind turbines against a dramatic, cloudy sky with orange and blue hues. The bottom half shows a close-up, low-angle view of solar panels, with the sun's rays creating a bright, hazy effect.

98.53%

of Costa Rica's total energy output came from
renewable sources, in 2018

The background of the right panel is a low-angle shot looking up at a dense forest of tall, thin trees with vibrant green foliage, reaching towards a bright sky.

Costa Rica has effectively brought
deforestation under control, with a success
rate

98%



Global perspective:

Sweden & Climate Change

Consequences of Climate Change
in Sweden and implemented
Solutions

Sweden : Causes



Fossil Fuels

Sweden's primary contribution to climate change is the burning of fossil fuels like oil, coal, and gas. These fuels are used to generate heat and electricity, and to run industrial processes, and power transportation.

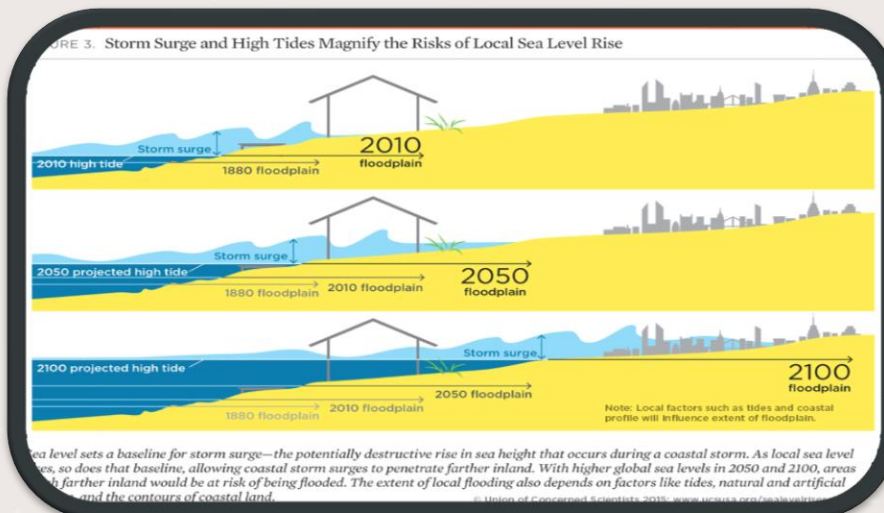
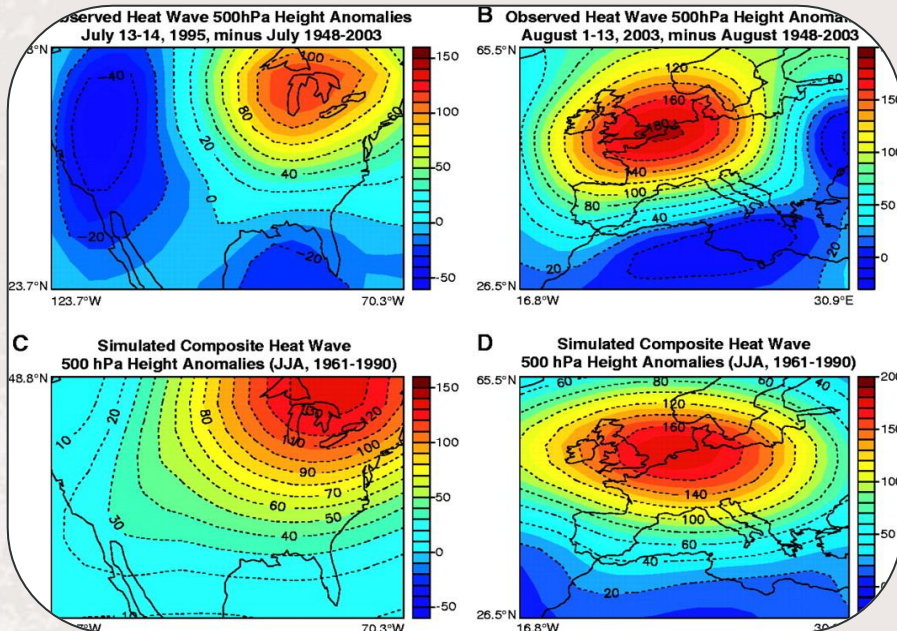
Energy & Industry

The energy sector and industrial activities in Sweden heavily rely on fossil fuels, leading to significant greenhouse gas emissions, which drive climate change.



Consequences of Climate Change in Sweden

- More Rainy Days
- Longer Heat Waves
- More Big Storms
- Higher seas, due to rising of sea levels



Sweden: Consequences

Floods



www.sott.net :Flood warning: "Swedish towns on high alert after rivers burst their banks"

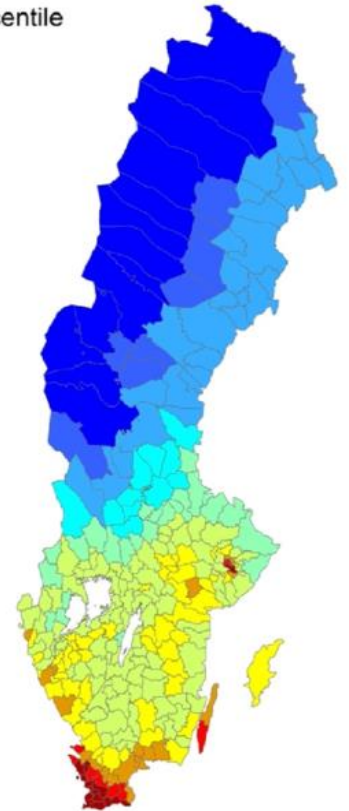
In the future, flooding may become more common along the country's southern coastlines as a consequence of rising sea levels. The impact on lakes and watercourses varies across the country; some areas expected to experience greater flood risk and others experiencing lower risk.

50th percentile



Air temperature (°C)
-1.0 0.2 2.3 3.4 4.5 5.6 6.7 7.8 8.9 9.10

95th percentile



Air temperature (°C)
12.0 : 15.0
15.0 : 16.0
16.0 : 17.0
17.0 : 17.5
17.5 : 18.0
18.0 : 18.5
18.5 : 18.7
18.7 : 19.0
19.0 : 19.2
19.2 : 20.2

"Map of Sweden showing the distribution of temperatures (• °C) by the 50th and 95th percentiles by municipalities."

Global Perspective : Sweden- Solutions



- **Renewable Energy Sources**

Most of Sweden's Energy nationally is derived from **renewable energy sources**, which makes up to about 60% of the energy generated from renewables alone. Intensive legislation targets reducing emissions further.

- **Future Transport**

Lorries have been replaced by electric cargo bikes for delivery purposes. Comparatively, it is much safer for children going to school, as well as the residents of the area, and more eco-friendly. This alternative provides two-fold benefits.

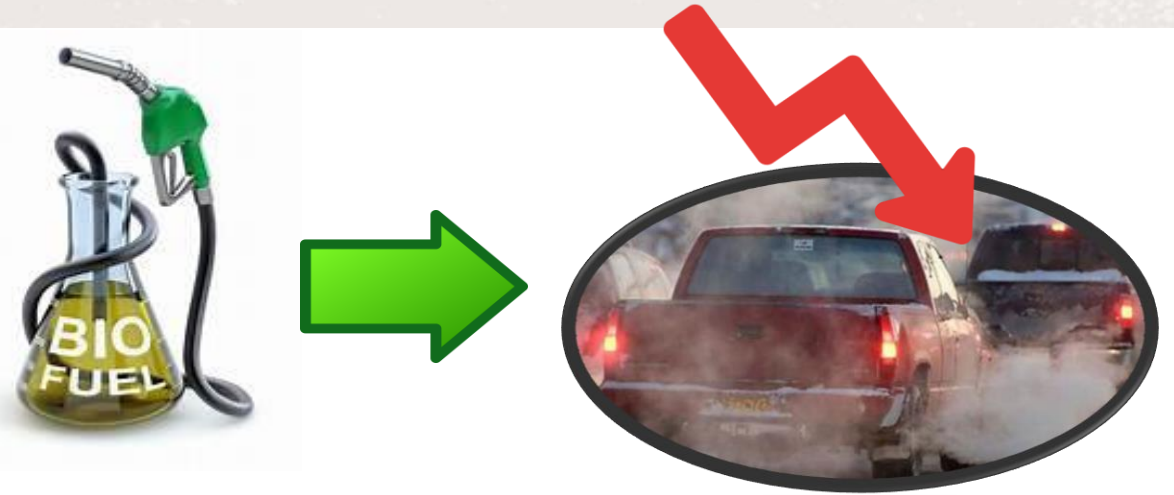


- ## Usage of Biofuels

The road emissions went down hill from 2018 to 2019 by 2%. As a consequence of increased **biofuel** share to 23% from 22%



Residents at Stockholm Royal Seaport may monitor their own current energy use, costs, and climate effect in real time.
Photo via City of Stockholm/imagebank.sweden.se



- ## Sustainable Housing

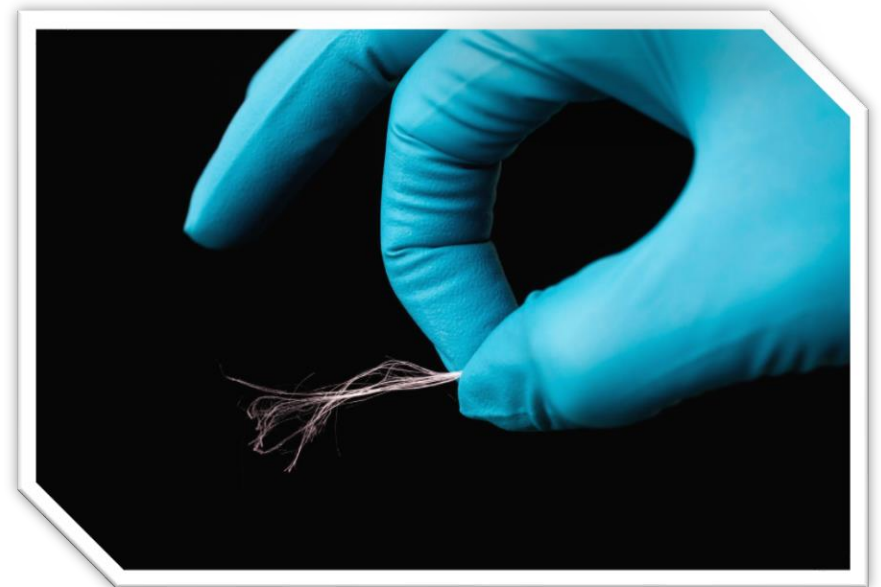
Norra Djurgårdsstaden, Stockholm Royal Seaport, which is situated at the very edge of Stockholm's urban park, uses olden gasworks to construct large number of **eco-friendly houses**, supplied with biogas generated from food waste, in addition to chargers for electric cars, and in the making of a new tram line

Turning Wood into Textiles

For development of textile, Institute RISE contains a test bed.

To manufacture yarns, fibres and unwoven fabrics from man-made and bio-based raw materials, researchers are inspecting and looking for procedures and materials

"TreeToTextile" – possessed by H&M Group, Inter IKEA Group, Stora Enso and LSCS Invest – concentrates on advancing the cellulose usage. **"TreeToTextile", is an advanced technology, which manufactures textile fibres, which are bio-based,** using wood that has a small environmental influence. That is to say, the Swedish forest supplies the wood, acting as the raw material, and clever technology wraps up the rest of the process



This is nanocellulose, which is stiffer and stronger than spider silk, comparable to Kevlar. It is the outcome of research at RISE and KTH Royal Institute of Technology and might be utilized for a variety of applications, including food packing. Photo by Sofia Sabel/imagebank.sweden.se.



Solutions – How You Can Help Save Earth



Reduce Single Use Plastics

Suggestions: Use reusable bags, bottles, and straws. Opt for products with minimal packaging.

Benefits: Reduces waste, conserves resources, and prevents plastic pollution.



Use Sustainable Transportation

Suggestions: Use public transportation, carpool, bike, or walk when possible. Consider switching to an electric or hybrid vehicle.

Benefits: Lowers greenhouse gas emissions, reduces air pollution, and conserves energy.



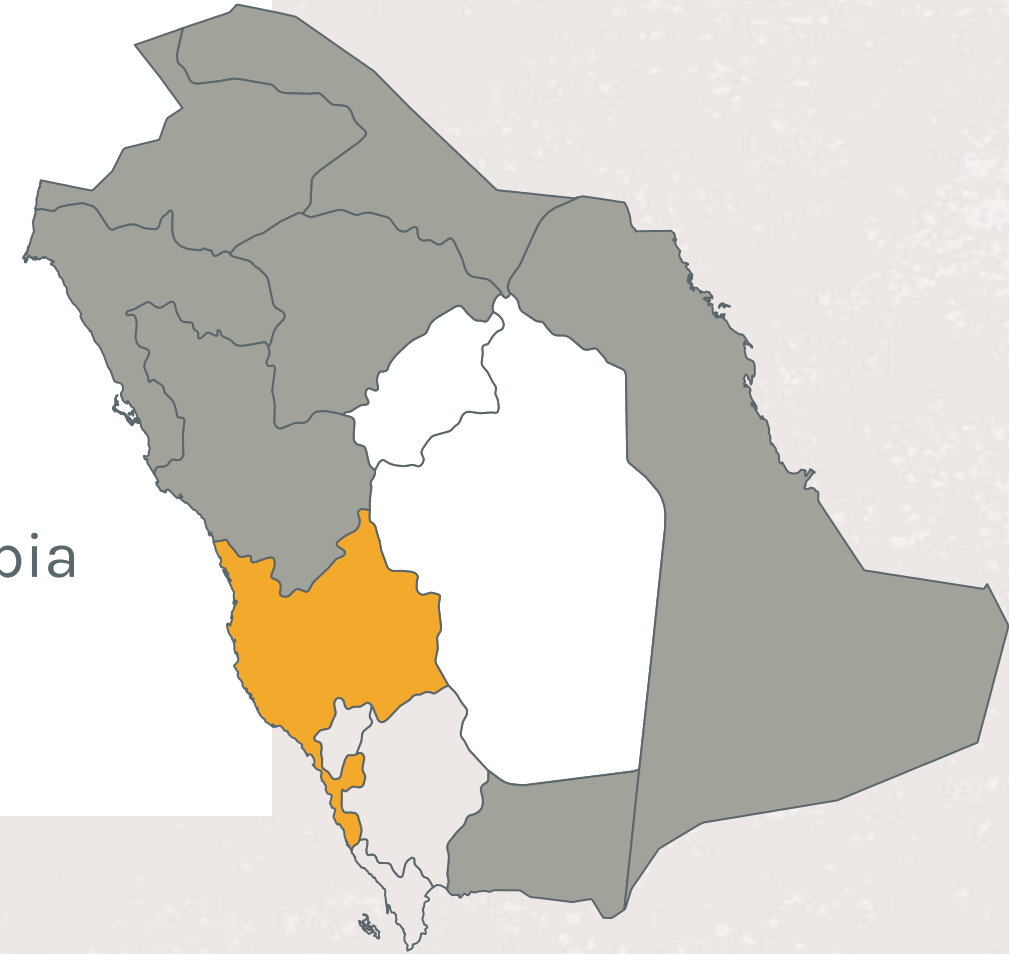
Improve Recycling Practices.

Suggestions: Sort recyclables correctly, reduce contamination, and increase recycling rates by participating in local programs.

Benefits: Reduces landfill waste, conserves natural resources, and minimizes pollution.

Saudi Arabia & Solutions

Solutions implemented by the Kingdom, & Solutions implemented in Costa Rica and Sweden and that can be adopted by Saudi Arabia & Finally : Solutions that may be difficult to implement in Saudi Arabia.



Solutions by Saudi Arabia

Investing in renewable Energy

By 2022, the Kingdom's total renewable energy capacity has reached 2.8GW; indicating an overall **300% increase**.

Reforestation and land restoration

By December of 2023, the Saudi Green Initiative has (SGI) has planted **43.9 million** trees and shrubs and rehabilitated **94,000 hectares** of degraded land across the kingdom. This is a significant step toward their goal of planting 600+ million trees and rehabilitating 8 million hectares of land by 2030.



The CCE National program

To accelerate the reduction of its CO2 emissions, the Kingdom is implementing the Circular Carbon Economy (CCE) National Program which uses four main strategies: the **4Rs; Reduce, Reuse, Recycle, and Remove**. This framework aims to transform its **linear** carbon economy into a **circular** carbon economy, as part of its efforts to reduce its carbon emissions by **278 million tons per annum by 2030**.



How Relevant are these Solutions for Saudi Arabia?

- ***Reforestation & Land regeneration:***

Both Costa Rica and Saudi Arabia have been putting great efforts into increasing their forest cover. Costa Rica's financial incentives to landowners can be adopted by Saudi Arabia to further robust its Saudi Green Initiative and increase reforestation rate. **This will improve the air quality and help to combat the accelerated species extinction since it helps restore habitats so they will have more biodiversity.**

- ***Ecotourism:***

In addition to Costa Rica, Saudi Arabia is also aiming to restore and protect natural ecosystems and nurture endemic flora and fauna. To further support this goal, Saudi Arabia can develop eco-friendly tourism, following Costa Rica's successful model. **This will attract tourists, generate income, and improve the economy.**

- ***Sustainable Transport Innovations:***

Sweden, as well as Saudi Arabia is putting efforts into reducing emissions of greenhouse gases. Sweden's approach with electric cargo bikes and low-emission vehicles serves as an excellent example. To improve its transportation sector's sustainability, Saudi Arabia can adopt similar innovations. **This will reduce emissions, improve air quality, and contribute to a safer environment for its citizens.**



How Relevant are these Solutions for Saudi Arabia?



- *Waste Management:*

Costa Rica's "pay to throw" initiative has led to a remarkable increase in recycling rates. Hence, Saudi Arabia could introduce a similar system to boost recycling efforts and enhance waste management.

This will lead to a cleaner environment and potentially reduce waste-related costs.

- *Turning Wood into Textiles:*

Sweden's approach to creating textiles from wood presents a model for Saudi Arabia; whereby investing in or adopting similar eco-friendly textile technologies, Saudi Arabia could reduce the environmental footprint of its manufacturing sector.

This will promote sustainable industry practices and open up new economic opportunities with foreign companies.

- *Biofuel Usage:*

Sweden's success in reducing road emissions through greater biofuel use indicates that Saudi Arabia could benefit from integrating more biofuels into its energy mix. This approach could help Saudi Arabia achieve lower emissions in its transportation sector.

This will contribute to a healthier environment and align with the country's sustainability goals.

Solutions that are difficult to implement in Saudi Arabia

Certain climate solutions that succeed elsewhere may encounter significant hurdles in Saudi Arabia.

- *Implementation of Electric Cargo Bikes:*

The **extreme temperatures** in Saudi Arabia pose a significant challenge for the use of electric cargo bikes, as the heat can impact battery efficiency and rider comfort. Given these conditions, many may prefer air-conditioned vehicles, making the adoption of cargo bikes less feasible.





Solutions that are difficult to implement in Saudi Arabia

- *Renewable energy:*

Although Saudi Arabia is pushing forward with renewable energy projects and putting great efforts, the shift is challenging. The country's economy heavy **dependence on oil and water scarcity** make hydropower and biofuels tough to develop.

Hence, it would be challenging to reach Costa Rica's 98.53% renewable energy capacity.



Solutions that are difficult to implement in Saudi Arabia

. *Turning wood into textile:*

While the idea of turning trees into textiles is innovative, it would be difficult for Saudi Arabia to adopt this approach on a large scale. The country's limited forest resources and harsh climate would hinder the production of raw materials needed for this process. As a result, replicating such a sustainable initiative on the scale seen in Sweden would be a significant challenge.

Last Form

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<https://forms.gle/ZMWWjaeszfPJZ2Xy9>



Thank you!

Do you have any questions?

If you do, please contact us on:

Osmanalaa291@gmail.com

Please visit Our Website: (Use a Laptop)

<https://osmanalaa291.wixsite.com/climatechange>

If you can't use a laptop you can click "desktop site" from your phone browser.

If you are here from the website, please return and fill the second form after reviewing the presentation/website.



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