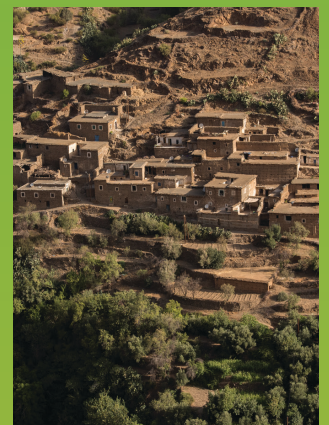


# Biodiversity

## in the Moroccan High Atlas and the World

An Environmental Education Resource



MOROCCAN BIODIVERSITY &  
LIVELIHOODS ASSOCIATION



Australian Government



Global  
Diversity  
Foundation  
A world of difference











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# INTRODUCTION



Through the expertise of the Moroccan NGO Moroccan Biodiversity & Livelihoods Association and their partner Global Diversity Foundation, this resource provides middle school students with a comprehensive overview of the threats that face the Mediterranean Basin Biodiversity Hotspot, particularly in the High Atlas Mountain Range of Morocco. With five sections, this resource defines and explores Biodiversity Hotspots around the world, investigates the impact of Climate Change, looks at other major threats to Morocco's biodiversity and the effects of Plastic Pollution, and introduces the Sustainable Development Goals.

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# Section 1: Biodiversity Hotspots

## What is Biodiversity?

The term biodiversity (from “biological diversity”) refers to the variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life.

**Biodiversity underpins all life on Earth.** Without species, there would be no air to breathe, no food to eat, no water to drink. There would be no human society at all!

## What are Biodiversity Hotspots?

Places on Earth that are both **biologically rich — and deeply threatened**. For our own sake, we must work to protect them!

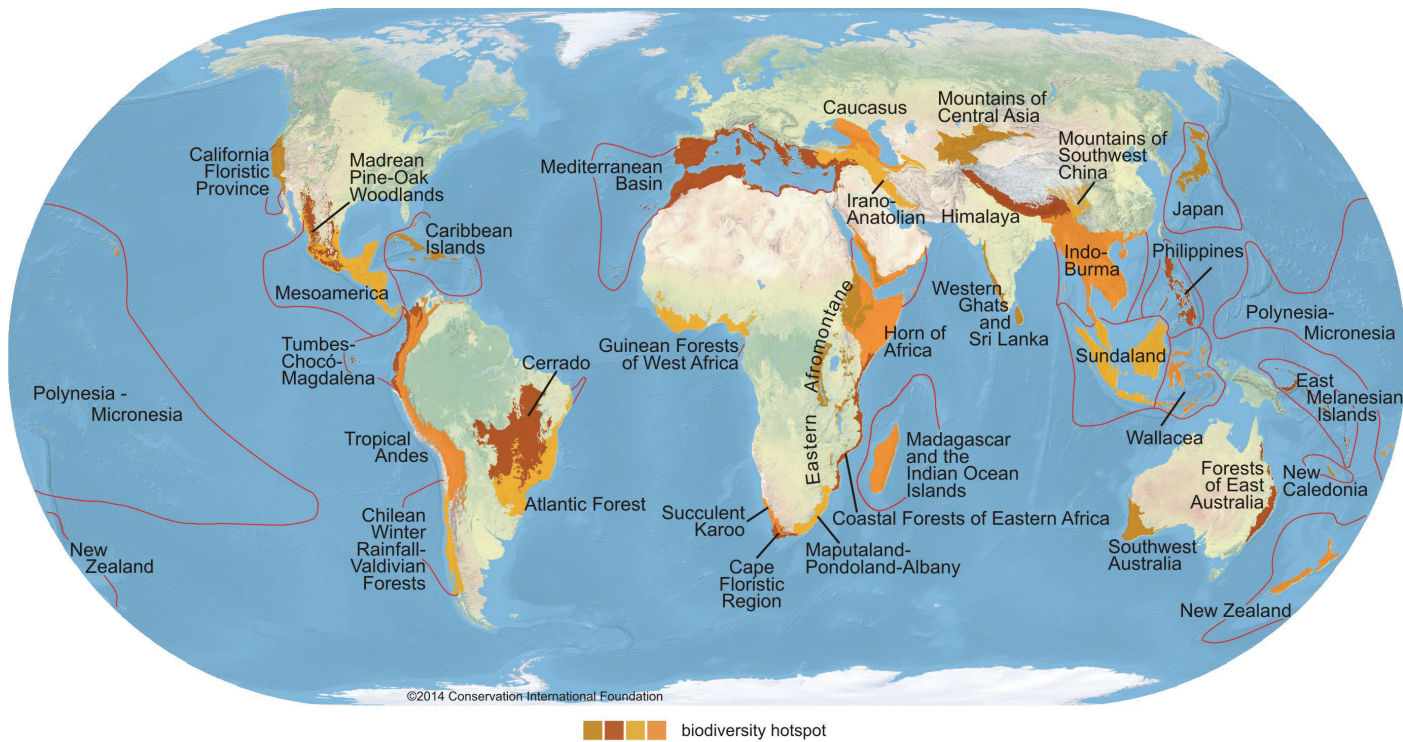
## Where do these Biodiversity Hotspots exist?

- Around the world, **36 areas** qualify as terrestrial hotspots.
- These represent just **2.4% of lands surface** - arguably the most important 2.4%!

## To be a biodiversity hotspot it must meet two criteria:

- It must **have at least 1,500 vascular plants as endemics** — which is to say, it must be rich in plant life found nowhere else on the planet.
- It must **have 30% or less of its original natural vegetation** — which is to say, it must be threatened.



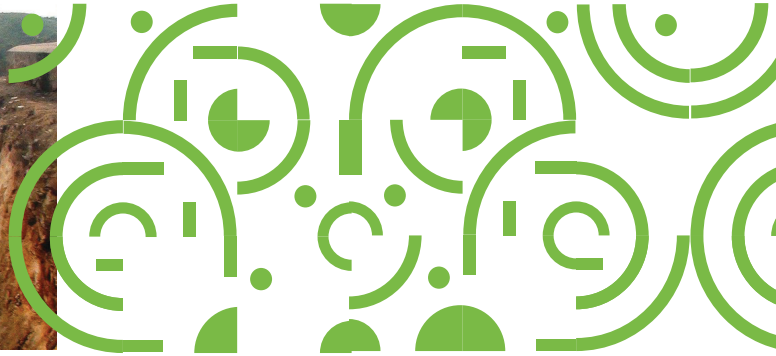
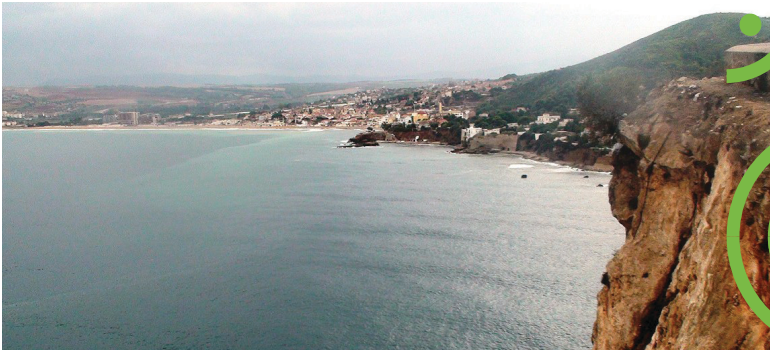


Humans have settled in biodiversity hotspots because they are rich in resources. Forests, wetlands and other ecosystems in hotspots account for 35% of the “ecosystem services” that vulnerable human populations depend on. Therefore, if the ecosystems within these hotspots were to disappear, this would not only be detrimental for the species within the ecosystem, but for humans too!

**A Small Matching Exercise for You!**

Using the above map, and your knowledge of geography, can you match the city to the biodiversity hotspot it is in?

1. Tangier, Morocco	●	● a. Cape Floristic Region
2. Mexico City, Mexico	●	● b. Sundaland
3. Mecca, Saudi Arabia	●	● c. California Floristic Province
4. Sydney, Australia	●	● d. Forests of East Australia
5. Los Angeles, USA	●	● e. Horn of Africa
6. Santiago, Chile	●	● f. Mediterranean Basin
7. Cape Town, South Africa	●	● g. Chilean Winter-Rainfall Valdivian Forests
8. Jakarta, Indonesia	●	● h. Mesoamerica



# Biodiversity Hotspot: The Mediterranean Basin



## QUICK FACTS

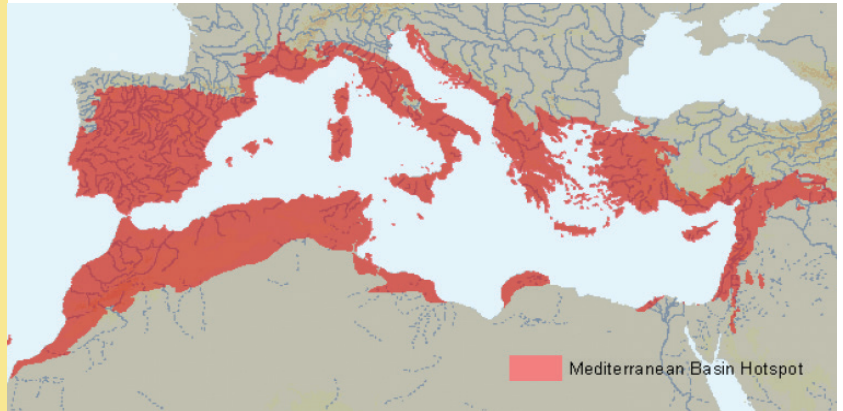
→ Approx. 2 million km<sup>2</sup>, making it the **2nd largest hotspot** in the world.

→ This hotspot contains approximately **25,000 plant species**, of which 13,000 are endemic, making it the **third richest hotspot** in the world. However, it has the lowest percentage of natural vegetation remaining of any hotspot, **less than 5 percent**.

→ There are over **300 species of mammals**, of which **89 are endemics** and over **489 species of birds**, of which **25 are endemic**.

→ **The Maghreb** holds a particularly high amount of the terrestrial mammals **under threat**.

→ This hotspot is home to about **515 million people**, and on top of that, the Mediterranean Basin is visited by an average of **220 million tourists** a year!



*The Mediterranean Basin stretches across more than 21 states, from Morocco in the west to Jordan and Turkey in the east, and from Italy in the north to Tunisia in the south.*

### 1 Which of the following countries is not a part of the Mediterranean Basin?

- a) France
- b) Mauritania
- c) Algeria
- d) Turkey

### 2 Which of the following species is not endemic to the Mediterranean Basin?

- a) Lavender
- b) Thyme
- c) Barbary Thuja Tree
- d) Christmas Flower





# The Mediterranean Basin Spotlight: High Atlas Mountain Range

## Who lives in the High Atlas?

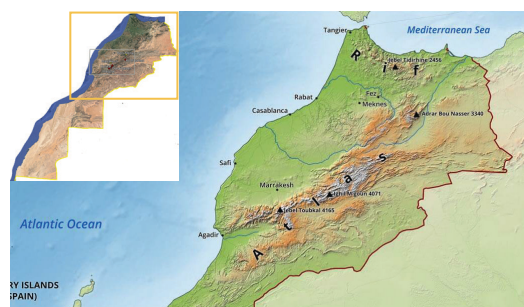
The High Atlas Mountains are predominantly populated by indigenous Amazigh communities, whose livelihoods depend on the biodiversity of the mountainous region in which they live. These communities' native languages are Tashelhit and Tamazight, but Moroccan Arabic (Darija) is widely spoken as well.

Many Amazigh households earn a living by rearing livestock, such as cows, sheep, and goats, and cultivating various crops, such as fruit and nuts, cereals, and root vegetables, to be sold in local markets. Medicinal plants such as thyme and lavender, are also collected in the wild and sold for a profit. Other households depend on **subsistence agriculture**, and grazing, with a long-held tradition of using **Agdals** to ensure that vegetation regenerates during the growth and reproduction season.

Water is a key resource to sustain livelihood in the High Atlas. Irrigation water is equally distributed among families and across cultivated areas during drought months and the traditional canals (seguia) are carefully maintained. Many of the plants growing in this managed landscape have a high cultural value as they are used in traditional recipes or as medicines. ***In order to maintain these communities' cultural traditions and livelihood, biodiversity must be protected!***

**Subsistence Agriculture:** A form of farming in which nearly all of the crops or livestock raised are used to maintain the farmer and the farmer's family, leaving little, if any, surplus for sale or trade.

**Agdals:** A traditional land management practice that governs access to communal pastoral lands and resources, mainly by fixing opening and closing dates.



## QUICK FACTS

→ The High Atlas Mountains stretch along **560 km through central Morocco**, separating the centre of Moroccan economic activity in the north from the Saharan influence in the south.

→ The High Atlas is **home to approximately 500 endemic plant species**, as well as 250 rare species.

→ The High Atlas include the **highest mountain peak in North Africa** (Toubkal, 4167 m).

# ENDANGERED

Species that are considered to be very high risk of extinction in the Atlas Mountains

## FAUNA

### 01. BARBARY MACAQUE (*Macaca sylvanus*)

Barbary Macaques are the only primate species endemic to the Mediterranean, with small populations left in Algeria, Morocco, and Gibraltar. They are in heavy decline because of heavy logging for charcoal and firewood, overgrazing, and the clearing of land for agricultural crops. On top of that, illegal trade is a threat to the species, as infant macaques are taken from the Atlas Mountains and sold in city markets as pets.



### 02. ATLAS DEER (*Cervus elaphus barbarus*)

The Atlas Deer is the only deer in Northern Africa. It has already gone extinct in Morocco once before, but populations from Algeria were reintroduced into the forests of the Atlas Mountains. It has been greatly affected by logging (cutting trees for sale), forest fires, and overgrazing, causing habitat loss for large portions of the Atlas Mountains.

### 03. CUVIER'S GAZELLE (*Gazella cuvieri*)

Home to the hills and low mountains of Morocco, Algeria, and Tunisia, the biggest threats to this endemic species are poaching and habitat degradation. Historically, this species occurs in all of Morocco's mountain ranges, and today, some small scattered groups can still be found in the High Atlas Mountains.



### 04. MOUNT ATLAS DAISY (*Anacyclus pyrethrum*)

This plant species is endemic to Morocco, Algeria, and Spain, and acts as an important remedy for diseases and conditions such as speech disorders, laryngitis, sickle cell anaemia, epilepsy and depression. Its greatest threats are premature exploitation and bad harvest practices such as root removal, which prevents it from growing again.

### 05. ASH TREE (*Fraxinus dimorpha*)

This tree species is endemic to Morocco and Algeria, where one may find small subpopulations of 15 – 50 trees in few isolated areas. Like the Mount Atlas Daisy, its greatest threat is overexploitation of the plant for domestic use as a remedy, or to trade with local herbalists. Deforestation and soil erosion are also major threats.



## FLORA





## Section 2: Climate Change

### What is Climate Change?

Climate change is **a significant change in climate** that a region experiences. While this can be caused by natural factors, the term climate change is now generally used to describe the changes in our climate **as a result of human activity**.

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### Weather vs Climate

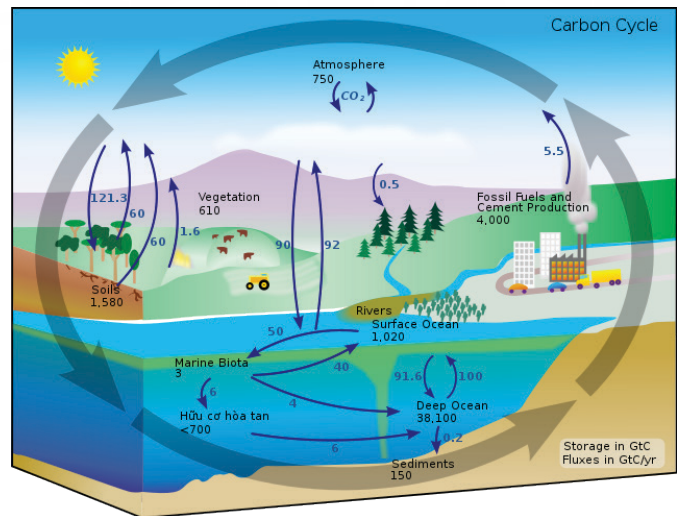
- **Weather** is a specific event or condition that happens over a period of hours or days.
- For example, a thunderstorm, a snowstorm, or today's temperature.
- **Climate** refers to the average weather pattern in a specific region for a long period of time.
- For example, the climate in Marrakech is hot and dry in the summer, whereas the climate in the winter in London, England is cold and rainy.

### CLIMATE CHANGE IN MOROCCO

*The effects of climate change are more and more present in Morocco. Rainfall has become more erratic and has declined by 3 – 30% in certain regions. The months of October and November have seen longer and more intense rainfalls, often causing floods, and less rain during the other months. In contrast, dry periods have become longer, particularly at the end of the rainy season. Extreme weather events such as heat waves, extreme rainfalls, floods and droughts have become more frequent and more severe.*

## Why is this happening?

To understand Climate Change, we must first understand the **carbon cycle**. Carbon dioxide ( $\text{CO}_2$ ) enters the Earth's atmosphere from decaying plants, volcanoes, breathing humans and animals, and the surface of the sea.  $\text{CO}_2$  leaves the earth's atmosphere when it is used by plants during photosynthesis, absorbed into the sea, or stored in soil and sediment. This cycle keeps everything on the earth alive. The  $\text{CO}_2$  in the atmosphere traps the heat from the sun.



That is why  $\text{CO}_2$  is called a **greenhouse gas**. It creates a blanket of warmth, known as the **greenhouse effect**, that keeps our earth from freezing.

## Greenhouse Effect

The greenhouse effect makes Earth a comfortable place to live. The amount of  $\text{CO}_2$  in the atmosphere over the last 8,000 years has been stable, creating suitable conditions for human beings to thrive. But about 200 years ago we began digging up the soil to extract fossil fuels. These fossil fuels (coal, oil and natural gas) are made from the remains of plants and animals that died long before humans evolved. The energies stored inside of them are used to fuel our factories, cars and to create electricity, but burning these fuels also releases more  $\text{CO}_2$  into the air. At the same time, we cleared forests for agriculture, reducing the ability of trees to remove  $\text{CO}_2$  from the air. While the greenhouse effect has allowed for human life to thrive for millennia, it is now trapping too much heat and causing **global warming**, which is the biggest threat to life on earth today.

### DID YOU KNOW?

*Did you know that every time we drive in a car, turn on the lights, or listen to music, we are contributing to the increase of greenhouse gases in our atmosphere? Most of what we purchase leads to  $\text{CO}_2$  emission in some way, either as a result of its manufacture and packaging, transport of the item, or both! The amount of  $\text{CO}_2$  that our own activities emit is referred to as our **Carbon Footprint**.*



## What is Global Warming?

Global warming refers to the rise in global temperatures, due mainly to the increasing concentrations of greenhouse gases in the atmosphere. **Global warming is the leading cause of climate change, but what is the leading cause of global warming? Human activity!** That's right, our planet's average temperature has increased 1° Celsius since the beginning of the Industrial Revolution, when humans started burning fossil fuels such as coal and petroleum for energy around 1750. While 1° Celsius might not seem like a lot, small changes in Earth's average temperature are unusual. In fact, during the last Ice Age, 20,000 years ago when most of the water on earth's surface was ice, average global temperatures were only 6° Celsius colder than today's average temperatures.

## Effects of Global Warming

Around the world, global warming is already making observable changes to our planet. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted, and trees are flowering sooner. A warmer climate creates an atmosphere that can collect, retain, and drop more water, changing weather patterns in such a way that wet areas become wetter and dry areas drier, and worsening many types of disasters, such as droughts, heat waves, tropical storms, and more.

### Droughts

In places around the world with typically dry climates, droughts are becoming more frequent, and more severe. Dry seasons are growing longer, and average precipitation during wet seasons is decreasing. Droughts can have serious consequences for people's livelihoods, affecting everything from agriculture and water supply to transportation and health.



During the last five decades, drought episodes in Morocco have taken place an average of three times per decade, which is three times more frequent than in the previous decades. Morocco was particularly hard hit by a prolonged drought in 2015 - 2016, which caused the cereal harvest to go down by 70%! This had a particularly negative impact on those who live in the High Atlas, where 70% of the local population depends on the agricultural sector to make a living.



## Wildfires

As dry areas have become drier, and heat waves have become more common and severe, one bad lightning storm or a poorly disposed cigarette butt can cause a wildfire, which have become harder to extinguish due to less predictable rains. The burning of forests releases large amount of carbon dioxide and other greenhouse gases into the atmosphere, therefore contributing even more to global warming and climate change.



**Morocco is at high risk of wildfires, and in recent years the fire season has increased in duration due to the decrease in precipitation. In August 2020 alone, Morocco recorded five major forest fires across the country.**

## Floods

A growing number of both coastal and inland communities around the world are finding themselves underwater. While global warming does not induce floods directly, it intensifies many of the factors that do. The warmer atmosphere has made our planet a lot wetter, with precipitation becoming a lot heavier during wet seasons. When a wet season precedes a dry season that was affected by drought or wildfires, the area is particularly vulnerable to flooding, as the dry,

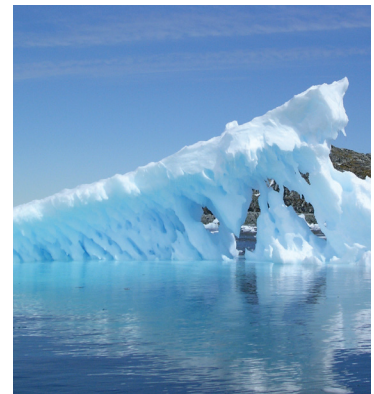


compacted, or barren soils don't absorb rainfall as easily. In regions where seasonal snowmelt plays a significant role in annual runoff, hotter temperatures make snow turn to rain, which induces faster and often earlier melting. Winter and spring soils are typically high in moisture or are still frozen and are therefore less able to absorb snow and rain runoff, which creates a greater risk of flooding.

**Morocco is prone to flash flooding, especially in urban areas that have poor water drainage systems.**

## Sea Level Rise

As ocean temperatures rise, the world's glaciers and ice sheets consequently melt. Our oceans are approximately 13 -20 cm higher today than they were in 1900. That's a pretty big change, given that in the previous 2,000 years our ocean's sea level hadn't changed much at all. Sea level rise is already causing coastal areas of the world to flood during high-tide, and it's projected to worsen and displace millions of people from their coastal homes as more glacier and ice sheets melt.



**Morocco has 3,500km of coastline, with several urban cities, such as Casablanca, and areas with high cultural and touristic importance, such as Essaouira. These cities are highly vulnerable to sea level rise.**



# Section 3: Threats to Biodiversity

Climate change, and other threats to biodiversity are, in large part, a result of human activity. There is a long list of human activities that negatively impact our environment around the world, but not every country and culture has the same impact. For example, China's biggest impact on the environment is burning coal as its main source of energy, but in Brazil, the leading source of carbon emissions and threat to biodiversity is deforestation in the Amazon rainforest. Let's take a closer look at what human activity in Morocco is threatening biodiversity and contributing to climate change.

## Deforestation

The most obvious way that humans overexploit land, causing it to degrade, is through deforestation. Removing trees can upset the balance of nutrients in the soil and takes away the roots that help bind the soil together, leaving it at risk of being eroded and washed or blown away. Not only does it degrade land, it also contributes to climate change. In fact, 10% of the world's carbon emissions is caused by deforestation alone. The most common drivers of deforestation include conversion to agriculture, infrastructure expansion and urbanization, and the overharvesting of forest products.

The government of Morocco has implemented a “Forests of Morocco” strategy that will plant 133,000 hectares of forests between 2020 and 2030 and slow the effects of climate change!

## Urbanization

Like in most countries around the world, more and more people in Morocco are moving from rural areas to settle in urban areas and cities. This population movement is referred to as **urbanization**, and is a primary driver of deforestation, because infrastructure, such as roads, buildings, and power supplies must expand to make room for the increased population. This is a major threat to Morocco's biodiversity, as it leads to habitat loss and **habitat fragmentation** – separating habitats into smaller, isolated fragments because of humans converting land into roads or farms, for example. As cities also require land and food for energy, vast areas must be converted into agriculture to sustain these cities, thus leading to more habitat loss. What's more, the demand and consumption of energy and water is higher in urban areas, intensifying both air pollution and water scarcity.



It's estimated that by 2030, the Mediterranean Basin will have the highest percentage of urban land of all the biodiversity hotspots around the world.



## Desertification

Morocco is covered by drylands, making it particularly vulnerable to **desertification** — the persistent degradation of dryland ecosystems by climatic variations and human activities. While global warming has caused temperatures to increase about 1.1 °C from pre-industrial times, the land surface has warmed by approximately 1.7 °C! These warmer surface temperatures make the land more susceptible to wildfires, and also speed up the decomposition of organic carbon soils, making them less able to retain water and nutrients. This makes it harder for crops to grow.

Unlike deforestation and urbanization, desertification is not directly caused by humans, but many humans are indirectly causing it to happen, often without even knowing it! As Morocco's human population increases, higher demands for food can lead to **overexploitation**, which causes desertification. Three ways humans overexploit the land is overgrazing of livestock, over-cultivation of crops, and deforestation. Overgrazing can strip land of vegetation and nutrients, making it unusable for agricultural purposes for years to come, whereas over-cultivation

exhausts the soil and leads to soil erosion. To prevent desertification and sustain the livelihoods of farmers, agriculture practices must be sustainable, and that includes irrigation! Inappropriate irrigation, by excessive extraction of groundwater, impacts land degradation greatly, as does climate change, which makes rains less predictable. As we cannot control the latter, we must do our best to not drain our soils of moisture for human use.



Desertification puts Morocco's biodiversity at risk! Without proper nutrients to grow, endemic species are being replaced by invasive species that are more capable of growing in degraded soils. Wildlife, such as large mammals like the Barbary Macaque or the Atlas Deer, are unable to adapt quickly to the degradation of their habitats.

**Did you know that approximately 32% of carbon is held in all the world's soils? As soils become more arid, they are less able to store carbon from the atmosphere and contribute to climate change!**

### **TIPS FOR REDUCING THE RISK OF DESERTIFICATION**

- *Rotational grazing of livestock.*
- *Increasing soil nutrients by leaving crop residues on the land after harvest.*
- *Planting fast-growing trees to provide shelter from the wind.*

# Section 4: Plastic Pollution

## What is Pollution?

Pollution is **the introduction of harmful materials into the environment**. These harmful materials, called pollutants, **can be natural**, such as volcanic ash, **or they can be created by human activity**, such as trash or runoff produced by factories. Pollutants damage the quality of air, water, and land, and **they pose a threat to biodiversity**.

The term **plastic pollution** refers to the accumulation of plastic objects and particles in the environment that cause harm to wildlife, wildlife habitat, and humans too.

Plastics are **organic materials**, just like wood or wool. The raw materials used to produce plastics are natural products such as cellulose, coal, natural gas, salt, and crude oil. They're extremely versatile and ideal for a wide and growing range of applications. What's more, plastic products are cheap to produce and are light weight, which saves companies on shipping costs.

## Everywhere you look, you'll find plastic!

Plastics are found in the clothes we wear, the houses we live in, and wrapped around the food we eat. Plastic is very malleable, which makes it the ideal material for a variety of shapes — such as bags, straws, bottles, buttons, and a whole lot more!



**Look around you – what plastic do you see in your surroundings?**



When plastics were invented just over a century ago, it seemed like the solution to all of our problems. They revolutionized medicine, made space travel possible, saved lives with helmets, and helped provide clean drinking water to those who need it. Without plastics, life today would look very different! Our plastic consumption has seen exponential growth in recent years, as production increased from 2.3 million tons in 1950 to 448 million tons by 2015 and is even expected to double by 2050! This growth has uncovered this adverse effect that the material is having on our planet.

### Harmful Effects of Plastic

Plastics are not compostable — in fact, **they can sometimes take 1,000 years or more to decompose** on landfill.

When plastics degrade, **they don't disappear but instead break down into smaller pieces and tiny particles known as microplastics.** These microplastics are nearly impossible to contain. They have even been found in municipal drinking water systems and in the air!

Plastics are made from unsustainable materials including coal, natural gases, and crude oil. **The manufacturing process emits huge amounts of CO<sub>2</sub>** and contributes to Global Warming.

**Not all plastics are recyclable.** Even those that are recyclable require new plastic to be produced to make a new product from the old plastic.

**Plastics kill millions of animals every year.** Sea birds and aquatic animals are particularly vulnerable to plastic ingestion, but even some land-based animals die from plastic ingestion. Marine animals can get entangled or swallow plastic waste, and ultimately end up dying from exhaustion and starvation.

About 40% of today's plastic are **single-use**, meaning they are only used once before being thrown in the garbage or recycling. While much of our plastic ends up in landfills, such as the one in this image, poor waste management systems lead to massive amounts of waste being littered. Rainwater and wind carry this plastic into drains, streams, and rivers, which in turn leads into the oceans, where enormous amounts of waste stays for years on end.



## Where does Plastic in our Oceans go?

A lot of it ends up in what's called **garbage patches**. These are areas of concentrated plastic marine debris, in areas of the ocean where trash tends to accumulate. They can be found in the ocean's five gyres, in the North and South Atlantic, the North and South Pacific, and the Indian ocean. **Gyres** are large systems of circulating ocean currents. But on top of circulating ocean waters, they draw in the pollution that we release in coastal areas. The biggest garbage patch is the Great Pacific Garbage Patch, located in the North Pacific Gyre. It covers a surface area of 1.6 million km<sup>2</sup>. That's roughly 3 times the size of France!



## Plastic in the Mediterranean Sea



Morocco's 3,500km of coastline spans both the Mediterranean Sea and the Atlantic Ocean. The Mediterranean Sea boasts incredible aquatic biodiversity, as part of the Mediterranean Basin hotspot. However, many of the species are highly threatened, and plastic pollution is one of the causes, as many Mediterranean Sea animals get entangled in or swallow plastic, and ultimately end up dying from exhaustion and starvation. Additionally, plastic waste releases chemical substances such as softeners or fire retardants into the environment, which can be harmful to both ecosystems and human health, especially in a semi-closed sea such as the Mediterranean.



x 500

A 2020 ICUN report estimates that 229,000 tonnes of plastic is leaking into the Mediterranean Sea every year. That's equivalent to over 500 shipping containers each day! Unless significant measures are taken to address mismanaged waste, the main source of the leakage, this will at least double by 2040.



# Section 5: Sustainable Development Goals

**SUSTAINABLE DEVELOPMENT GOALS** or (SDGs) are the blueprint to achieve a better and more sustainable future for all. They were adopted by all United Nations Member States in 2015, including Morocco, as an urgent call for action by all countries — developed and developing — to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030.



**If achieved, which of these goals would make the biggest difference in YOUR life?**

**Which of these goals do you think YOU can help the world achieve? How?**

## Let's Take a Closer Look at Goals 13, 14, and 15

### 13 CLIMATE ACTION



#### Goal: Take urgent action to tackle climate change and its impacts.

The Member States have agreed to:

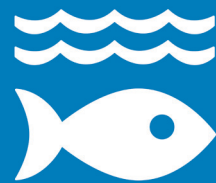
- Ensure people are well prepared for hazards related to climate and natural disasters.
- Address climate change issues in their governments' agendas and allocate resources to combat climate change.

#### Goal: Conserve and sustainably use the world's ocean, seas and marine resources.

The Member States have agreed to:

- Reduce marine pollution by 2025, since much of the pollution comes from human activities on land.
- Enact laws that prohibit illegal fishing, overfishing, and other destructive fishing practices.
- Provide financial support to the poorest countries and small islands to protect and have better management of marine resources.

### 14 LIFE BELOW WATER



#### Goal: Sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.


### 15 LIFE ON LAND



The Member States have agreed to:

- Protect and conserve ecosystems (for example, deserts and rainforests) by respecting signed international agreements.
- Reduce deforestation and plant more trees in order to reforest.
- Protect and urgently prevent the extinction of endangered species; stop uncontrolled hunting and trafficking of protected species of flora and fauna.

**Although governments can have a huge impact on whether or not we can collectively achieve these goals, it's not just up to them. We all have to do our part!**



## 5 Simple Actions YOU can take to help achieve Goals 13, 14, and 15

**1. Use a reusable Water Bottle.** About 58 billion throwaway cups are used each year, using more than a million tons of paper and 100 billion litres of water. Keep plastic out of our oceans and save CO<sub>2</sub> emissions and water by using a reusable bottle!

**2. Eat more Plant-Based meals.** A diet that is in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds, and lower in animal-based foods, generally has a lower environmental impact. By eating more plant-based meals, you can help reduce greenhouse gas emissions as well as land, energy and water use.

**3. Bring your Own Bag.** Up to 5 trillion single-use plastic bags are used every year. Each plastic bag uses almost a litre of water and creates about 20 grams of CO<sub>2</sub> emissions. Bringing your own shopping bag helps reduce emissions and cuts down on plastic waste in our world!

**4. Turn off the Lights:** If you turn off the lights whenever you leave, you're saving energy and money that adds up in the long run. Each time you turn a 60kw light bulb off for 4 hours, you save 0.24 kWh of electricity and about 100 grams of CO<sub>2</sub> emissions.

**5. Compost your Food Waste.** Compost is a key tool in the global fight against climate change. It benefits the climate in a few different ways, including by reducing greenhouse gas emissions at landfills, by promoting uptake of carbon dioxide by vegetation, and by making our projects and gardens more resilient to the effects of climate change.



**Discuss with your peers – What other actions can you take to help achieve these goals?**



## CLASSROOM QUESTIONS

1. What would life on earth look like without biodiversity?
2. What are the two criteria that an area must meet in order to qualify as a hotspot?
3. Is there a relationship between human population density, and the location of biodiversity hotspots?
4. List three points that make the Mediterranean Basin Hotspot unique.
5. What are the primary occupations of those who live in the High Atlas Mountain range?
6. Name one endemic wildlife species that is classified as endangered in Morocco. What are the threats to this species?
7. Name one endemic plant species that is classified as endangered in Morocco. What are the threats to this species?
8. What is the difference between Climate and Weather?
9. What changes is Morocco experiencing as result of Climate Change?
10. What are Greenhouse gases?
11. What is the relationship between the greenhouse effect, global warming, and climate change?
12. What is the relationship between global warming and droughts?
13. What is the relationship between global warming and wildfires?
14. What is the relationship between global warming and floods?
15. What is the relationship between global warming and sea level rise?
16. Name 3 human activities that lead to habitat loss.
17. Give three reasons why plastic pollution is harmful to our planet.
18. Where does plastic accumulate in the ocean?
19. What are the Sustainable Development Goals, and by when are they supposed to be achieved?
20. List 5 actions you can take to help combat Goals 13, 14, and 15.





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## NOTES

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## NOTES

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