



# Afforestation Campaign Report

Under project: The impacts of Climate Changes in The  
Region Surrounding Al-Mustaqbal University

In collaboration with Babylon Agriculture Directorate



## Background

Iraq, once the lush breadbasket of Mesopotamia, now grasps with the tightening grip of climate change. Rising temperatures parch-thirsty land, transforming fertile fields into dusty plains. The Tigris and Euphrates, lifelines for millennia, shrink to mere threads, leaving farmers staring at cracked earth and dwindling livelihoods. Desertification creeps like a malevolent shadow, swallowing villages and displacing communities. This water crisis is not just environmental; it's a societal earthquake, threatening food security, fueling social unrest, and casting a long shadow over Iraq's future.

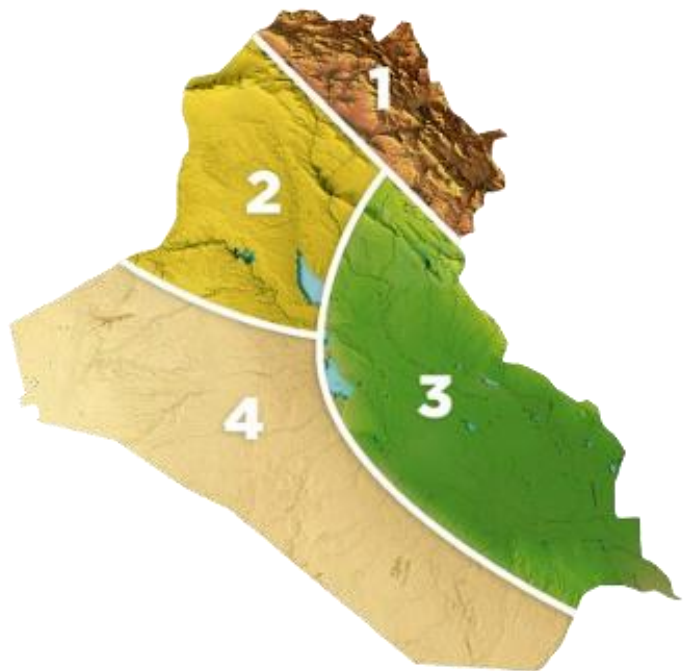
Yet, amidst the stark reality, glimmers of hope flicker. Universities, once bastions of ancient knowledge, now transform into hubs of climate resilience. Research labs churn out drought-resistant crops, while classrooms buzz with the voices of future environmental engineers and climate activists. Local communities, empowered by university outreach, adopt sustainable practices and water-saving techniques. The battle against climate change in Iraq may be daunting, but with universities forging alliances with communities and embracing the mantle of innovation, there's a chance to rewrite the narrative – from fragile crescent to verdant oasis, one resilient step at a time.

## Geography and Climate in Iraq

Situated in southwest Asia, the Republic of Iraq shares borders with Turkey to the north, Iran to the east, Jordan and Syria to the west, and Saudi Arabia and Kuwait to the south. The country exhibits diverse topography, divided into four distinct regions: mountains to the north and northeast (1); a northern upland region between the Tigris and Euphrates rivers (2); central and southeastern Iraq's Tigris-Euphrates alluvial lowlands (3); and the desert to the west and south (4).

Iraq experiences a predominantly continental and subtropical semi-arid climate, except for the northern and northeastern mountainous regions, which have a Mediterranean climate. The country observes two major seasons with distinct weather patterns. Summer, lasting from late April to October, is characterized by clear skies, exceptionally high temperatures ranging from 35 to 51 degrees Celsius, low relative humidity, and minimal precipitation. Winters, spanning from November to March, are mild to cold, with temperatures ranging between 2 and 15 degrees Celsius.

Rainfall in Iraq is seasonal, predominantly occurring between December and February for most of the country. However, in the north and northeast regions, the rainy season extends from November to early April. This geographical and climatic diversity contributes to the unique environmental conditions experienced across Iraq, influencing the livelihoods and activities of its inhabitants.







## Climate Change: Now and the Future

In recent times, global climate change has unequivocally established itself as an undeniable reality. Iraq, grappling with its own set of challenges exacerbated by a fragile state and deteriorating infrastructure, stands at the forefront of experiencing the multifaceted impacts of climate change. Once considered the Middle East's breadbasket and a part of the Fertile Crescent, Iraq has deviated significantly from that historical norm. The nation is now grappling with rising temperatures, diminishing rainfall, escalating desertification, severe sandstorms, diminishing water resources, agricultural setbacks, and economic disruptions on a national scale.

The consequences of climate change are acutely felt across Iraq's 42 million inhabitants, who are concentrated in specific regions due to the harsh climate. This concentration has direct implications for the people, affecting their lives, economic prospects, and posing challenges to water and food security. According to projections from the Climate Change Knowledge Portal and USAID, Iraq faces a grim future if immediate measures to mitigate the crisis are not implemented. By the year 2050, it is anticipated that the mean annual temperature will rise by 2°C. Simultaneously, the mean annual average rainfall is expected to decrease by 9%, with the most substantial reduction of 17% anticipated during December, January, and February. The projections also indicate an increased frequency of heatwaves, a reduction in the number of frost days, a decrease in the maximum amount of rain falling in any 5-day period, but an overall increase in rainfall intensity. Additionally, an average 22% decrease in runoff across the nation is anticipated, signaling a critical need for proactive measures to address the impending challenges posed by climate change in Iraq.

# Desertification in Iraq

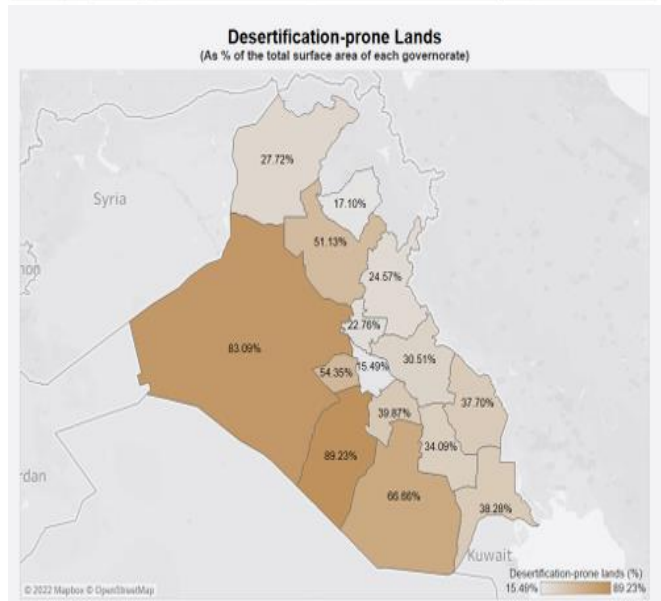
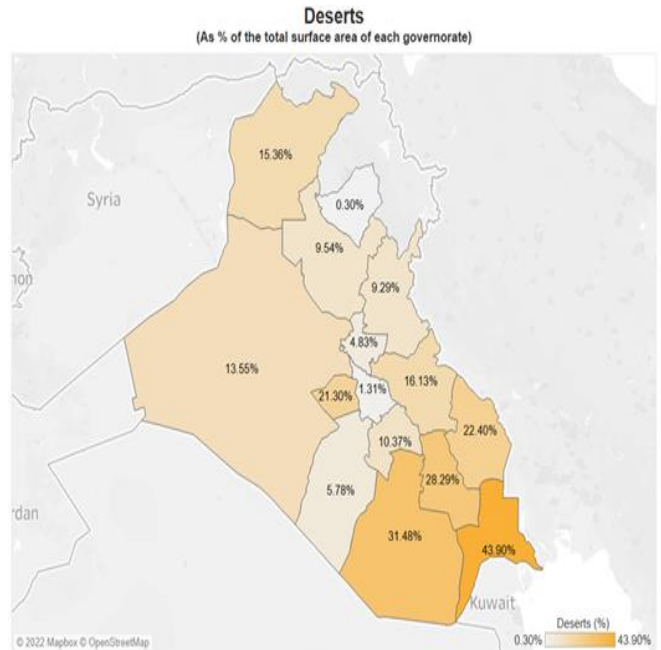
The United Nations Convention to Combat Desertification, held in 1994, defines desertification as "land degradation in arid, semi-arid, and dry sub-humid areas resulting from various factors, including climatic variations and human activities."

In Iraq, desertification is a complex issue driven by a combination of climate-related factors and human-induced actions. Climate elements such as high temperatures, water scarcity, and soil erosion contribute significantly to the problem. However, human activities, including population growth, unregulated tree felling leading to deforestation, poor water management, and inefficient farming practices, exacerbate the issue.

This confluence of factors has pushed Iraq to the brink of agricultural collapse, with an annual loss of 100 square kilometers of arable land due to desertification. Over 40% of the country is already classified as a desert, and the agricultural sector continues to decline. Between 1970 and 2010,

cultivated lands decreased from 12.2% to 8.3% of the total area. The rapid growth in population, from 7 million in 1960 to 40 million in 2020, has intensified the pressure on agricultural lands, leading to increased demand for crops and food that the struggling agricultural sector finds challenging to meet.

The economic repercussions of desertification are substantial. A decline in agricultural output forces small-scale farmers to migrate from dried-up farms to urban centers, triggering competition for limited resources and employment opportunities. Moreover, desertification negatively impacts irrigation, biodiversity, natural ecosystems, and livestock populations. Between 1990 and 2010, an estimated 6,000 plant species were lost due to desertification. Addressing the challenges posed by desertification in Iraq requires a comprehensive and sustainable approach that considers both climatic and human-induced factors.



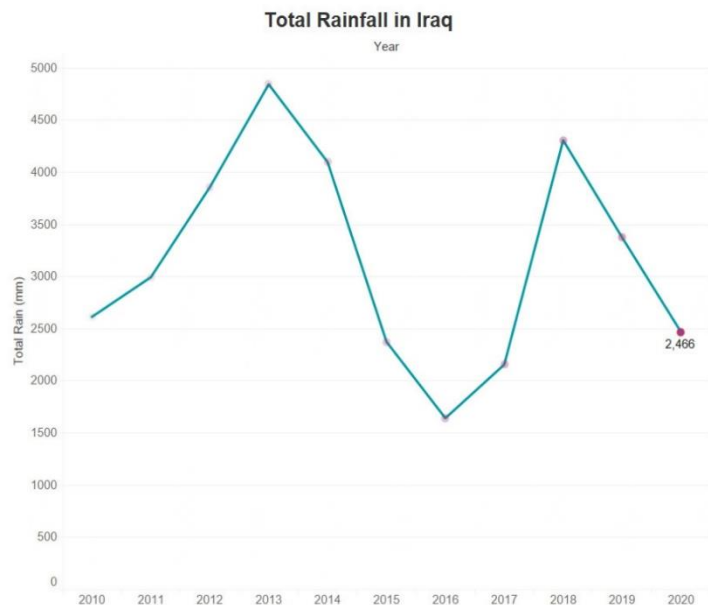
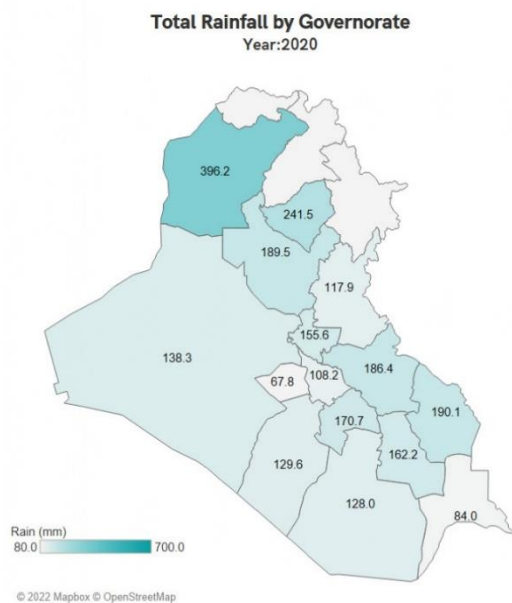
# Precipitation in Iraq

Rainfall plays a pivotal role in shaping the Earth's biosphere, and fluctuations in precipitation levels can have profound effects on ecosystems and various aspects of life. In Iraq, a country highly vulnerable to climate impacts, a looming calamity is evident due to a significant decrease in precipitation and its detrimental consequences on the ecosystem.

Iraq experiences notable variability in precipitation both seasonally and regionally. The northern and north-eastern regions receive the highest rainfall, ranging from 400 to 1,000 millimeters per year, predominantly occurring between November and March. The steppe, with an annual average of 200 to 400 millimeters, and the southern part of the country, receiving only 40 to 60 millimeters, witness precipitation primarily from October.

The winter season of 2020–2021 marked the second-lowest record in four decades, characterized by below-average rainfall, especially in Iraq's northern governorates. This weather pattern persisted from November 2020 to January 2021. However, between February and April 2021, precipitation levels were above average in the central regions, particularly the Diyala and Wasit governorates.

Conversely, the northern regions, including Nineveh, Duhok, and Erbil, experienced below-normal precipitation during this period. This had severe consequences for communities relying heavily on rainwater for agriculture. The seasonal overview from November 2020 to April 2021 highlighted rainfall below normal in several northern regions, with precipitation up to 40% below average. This likely led to reduced planted areas, crop failures, and a significant impact on the production of wheat and barley, the major rainfed winter crops. These trends underscore the immediate and tangible consequences of changing precipitation patterns on Iraq's agricultural sector and food security.







## Trees Plantation Towards a Sustainable Future

Amidst the bustling academic life of a university campus, lies a powerful tool for combatting climate change and fostering a healthy environment: trees. Their leafy presence isn't simply an aesthetic touch; it's a strategic investment in the fight against global warming and aligns with several United Nations Sustainable Development Goals (SDGs).

By acting as natural carbon sinks, campus trees devour harmful greenhouse gases, contributing directly to SDG 13 on Climate Action. A mature tree can absorb nearly 48 pounds of carbon dioxide annually, offsetting emissions and mitigating the impacts of climate change. This leafy network cools the urban environment, aligning with SDG 11 on Sustainable Cities and Communities by reducing the urban heat island effect and improving air quality. Cooler temperatures and cleaner air translate to healthier communities, directly impacting SDG 3 on Health and Well-being.

However, the benefits extend beyond mitigating environmental threats. Green spaces on campus provide havens for stress reduction and mental rejuvenation, aligning with SDG 3 once again. Studies show that exposure to nature improves cognitive function and well-being, creating a more conducive environment for learning and personal growth. These living laboratories also spark environmental awareness and engagement, driving progress towards SDG 15 on Life on Land and fostering responsible citizens of the future.

Planting trees on a university campus is a tangible step towards a sustainable future. It tackles climate change head-on, promotes health and well-being, fosters environmental responsibility, and empowers communities – all while creating a vibrant and flourishing campus ecosystem. By nurturing these verdant sanctuaries, universities can rewrite the narrative of their role in the world, becoming not just centers of knowledge, but also beacons of environmental action and positive change.



## A Verdant Tapestry: Four Trees for a Flourishing Campus

University campuses are often sprawling spaces with a mix of buildings, open areas, and parking lots. While these elements serve their purpose, they can also create an environment that feels sterile and disconnected from nature. Planting trees is a simple yet impactful way to transform a campus into a vibrant and sustainable space, and Eucalyptus, Casuarina, Dodonaea, and Albizia offer unique benefits that make them ideal choices for this purpose.

### Eucalyptus:

Eucalyptus trees are known for their rapid growth, providing shade and visual interest quickly. Different Eucalyptus species thrive in diverse climates, making it easy to find varieties suited to the specific region of your campus. They stand act as effective windbreaks, reducing dust and noise pollution on campus. its flowers attract pollinators like bees and butterflies, fostering biodiversity and creating a more welcoming environment for wildlife.

### Casuarina:

Casuarina trees have symbiotic bacteria in their roots that fix atmospheric nitrogen, enriching the soil and reducing the need for chemical fertilizers. Casuarina's deep roots help prevent soil erosion, especially on slopes or near water bodies. Some Casuarina species are naturally fire-resistant, making them a valuable choice in regions prone to wildfires.

### Dodonaea:

Dodonaea is a hardy tree that requires minimal water, making it perfect for water-scarce regions. Dodonaea thrives with minimal pruning and fertilizing, reducing maintenance costs and workload for campus groundskeepers. Its evergreen leaves come in various shades of green and provide year-round visual appeal. It can be planted as individual trees, hedges, or windbreaks, offering flexibility in campus landscaping.

### Albizia:

Albizia trees grow quickly, providing much-needed shade for students and faculty on hot days. Like Casuarina, Albizia fixes atmospheric nitrogen, improving soil quality and reducing fertilizer reliance. Its delicate pink or white flowers and fern-like leaves add a touch of elegance to the campus landscape. Its flowers attract a variety of pollinators, promoting biodiversity and contributing to a healthy ecosystem.

By choosing a selection of Eucalyptus, Casuarina, Dodonaea, and Albizia, universities can create a greener, healthier, and more vibrant campus that benefits the environment, the student body, and the wider community.





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## Afforestation Campaign on Campus

Al-Mustaqbal University in collaboration with Babylon Agriculture Directorate and under the supervision of Al-Mustaqbal University President Prof. Dr. Hasan Shaker Majdi organized a campaign to plant over 160 evergreen trees of different species including Eucalyptus, Casuarina, Dodonaea, and Albizia over an estimated area of 400 m<sup>2</sup>. The species was chosen carefully based on their different merits including water consumption and drought resistance. This campaign is part of the university's effort towards combating climate change and achieving United Nations sustainable development goals.



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# Designated Areas for Trees Planation on Al-Mustaqbal University Campus



