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Forests for Climate Change Mitigation: A Case Study of Basra

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A brief overview of the Iraq Policy Program

The Iraq Policy Program aims to bridge the gap between youth elites and decision-makers by training young elites to effect positive change through influencing the decision-making process. The program aims to empower participants to prepare policy papers and propose policy alternatives aimed at enhancing system performance and supporting its legitimacy. This program enables participants to communicate with decision-makers and understand the main difficulties and problems affecting the implementation and follow-up of public policies. Additionally, the program seeks to provide participants with a realistic understanding of the decision-making environment in Iraq, as well as an understanding of the opportunities and challenges of change.

The program stages

Preparation: Assisting participants in acquiring the fundamental skills to prepare policy papers and effective advocacy campaigns.

Discovery: Clarifying important public policies in Iraq by experts through stakeholder engagement, frameworks and institutional procedures, practical realities, and discussions surrounding each public policy, as well as reform prospects.

Engagement: Training participants to develop promotional campaigns and coordinate meetings with government officials to initiate their campaigns.

Enrichment: Supervising participants to prepare a policy paper in their area of interest to enrich dialogues, develop policy alternatives, which can help address current challenges.

About the Center

The Platform for Sustainable Development is a registered center with the Non-Governmental Organizations Department at the General Secretariat of the Council of Ministers under the number (1S2106012). It serves as a space for thought, dialogue, and action towards positive change.

Vision

We seek to establish a platform for dialogue and policies that contribute to achieving the Sustainable Development Goals in Iraq.

Mission

Filling the gap between the state and society to ensure the essence of democracy by engaging citizens in the decision-making process through training, monitoring, analysis, research, awareness, and advocacy.

Strategic Goals

- Preparing a youth elite that rises to its social responsibilities through studying problems, proposing policy alternatives, and working towards their implementation.
- Utilizing knowledge outputs and encouraging youth to work towards achieving the Sustainable Development Goals
- Presenting statistics and issues that occupy the political arenas and societal circles to reflect a deeper understanding of the Iraqi reality.
- Creating a network of active, informed, and committed citizens dedicated to the project of building the Iraqi government.



Executive Summary:

Climate change in Iraq has created challenges for its environment, security, politics, and economy. Rising temperatures, severe droughts, reduced rainfall, desertification, salinization, and increased dust storms have all undermined Iraq's agricultural sector. Additionally, Iraq's water security relies heavily on the diminishing flow of the Tigris and Euphrates rivers. National and regional political changes will make climate change mitigation and water management extremely difficult. Climate change, including rising temperatures, decreased rainfall, and increased water scarcity, is expected to have serious repercussions on Iraq for years to come. Furthermore, per capita greenhouse gas emissions in Iraq are higher than the global average. Climate change affects various aspects of life, including food security, and natural resource scarcity, which in turn affects population distribution and leads to communities relocating in search of more suitable places. These changes also have economic and security implications.

This paper proposes a policy alternative in the form of a program called "Forests, Green Spaces, and Nature Reserves," which involves planting extensive areas of land in various locations in the Basra Governorate. This program aims to reduce pollution, lower emissions, and positively impact community and mental health. The "Revive Mesopotamia" project, as part of this program, is based on nine objective steps designed to bring about real change. It is intended to align and enhance the broader climate goals of the Iraqi government, reaffirm its commitment to the Paris Agreement, and provide regional solutions to climate-related challenges. To ensure the project's success, a concerted national effort involving all relevant ministries is required to design and implement a series of climate-related policies and laws, combining state expenditure, funding from green funds, private capital markets, and international donors to finance substantial new investments in this area.

This program enjoys strong support from various segments of society, as well as local and international institutions and companies. Through this proposal, the researcher aims to encourage the local government to allocate these spaces to improve the environmental, economic, and recreational reality of the Basra Governorate.



Introduction:

Climate change is defined as long-term changes in temperature and weather patterns. While these changes can be natural, human activities have become the primary drivers of climate change, primarily through the burning of fossil fuels such as coal, oil, and gas. The burning of fossil fuels releases greenhouse gases that act like a blanket around the Earth, trapping heat and raising temperatures. Greenhouse gas emissions responsible for climate change include carbon dioxide (CO₂) and methane (CH₄). These gases are produced, for example, by burning gasoline for driving cars or using coal for heating buildings. Land-use changes like deforestation and forest clearing for agriculture can also release significant amounts of carbon dioxide, and landfills are a major source of methane emissions. Energy production, industrial processes, transportation, buildings, and agriculture are among the major sources of emissions.

Climate change exacerbates numerous problems. Taking Iraq as an example, the use of fossil fuels (oil) is a major contributor to climate change. Additionally, the uprooting of orchards, where much of the land has been turned into residential areas due to the absence of planned new cities, has resulted in a temperature increase of 1.8 degrees Celsius over three decades in Iraq. This temperature rise is particularly pronounced in the south, forcing families to sell their livestock, pack their belongings, and migrate to urban centers like Basra in search of better job opportunities and services, but they are not always welcomed, as reported by The Washington Post. Recent studies by the International Organization for Migration (IOM) have highlighted climate-induced migration of rural populations and farmers moving to the southern city of Basra in search of alternative job opportunities. These migrants face various challenges while trying to settle in new environments with limited financial and social capital, which can impact their ability to access services and assert their rights.



Background: Basra Facing Climate Change

In a survey conducted by the Norwegian Refugee Council last year, approximately 40% of farmers across Iraq reported near-total wheat crop loss. Obtaining precise migration figures for Basra is challenging, as migrants live in the shadows, with temporary homes built on barren land isolated from basic services like water and electricity. Data from the Basra Environmental Directorate indicates that water deterioration in the province cost Iraq approximately 400 million dollars in lost livestock, date palm trees, and crops in 2018. In response, the Iraqi government has attempted to mitigate climate change by endorsing the Paris Agreement in 2021 and seeking climate finance through the Green Climate Fund, tied to meeting the conditions set in the Paris Agreement. Iraq aims to attract more foreign investments in clean energy to enhance food security and production. On another front, Iraq fulfilled its nationally determined contribution (with support from the United Nations Development Programme) to voluntarily reduce emissions by 1-2% by 2030.

This plan focuses on sectors like oil, gas, electricity, and transportation, which collectively produce about 75% of Iraq's total greenhouse gas emissions. Therefore, our policy proposal today aims to increase green spaces and government-protected areas. In the future, there must be a reconsideration of agricultural land laws and a shift to residential use, which has disrupted the environmental balance. Some of the most critical issues affecting Basra due to climate change include:

1. Rising temperatures, decreased rainfall, and increased dust storms due to reduced vegetation cover.
2. High levels of pollution from fossil fuels, increased carbon emissions, leading to various health issues, including cancer.
3. Demographic changes resulting in housing crises and uneven population density, along with some security problems.

The following data highlights the severity of these changes based on official records, showing the extent of temperature and rainfall changes in Basra over the past years:



Southern Region (Basra Station):

- **Annual Average Temperature:** The highest annual average temperature recorded was 27.9°C in 2010, while the lowest was 23°C in 1943.
- **Maximum Daily Temperature:** There is an upward trend in maximum daily temperatures, with an annual average for the period 1941-2010 being 2°C higher than the overall average of 32.1°C.
- **Rainfall in Basra Province:** Rainfall in the Basra station is generally decreasing, with a 10mm decrease from the annual total of 140.4mm.

The Role of Agricultural Areas and Trees in Environmental Protection

Trees and shrubs directly or indirectly affect their surrounding environment by preserving production resources, protecting soil from erosion and runoff, increasing groundwater reserves, improving surface water quality, reducing sedimentation in dams and reservoirs, maintaining productive land capacity, increasing organic matter, and reducing salinity and drought through significant shading of the soil surface and reduced evaporation. They also influence wind patterns, increase rainfall, and play a significant positive role in climate change mitigation.

The presence and expansion of vegetation and forests play a crucial role in creating local climatic ecosystems that positively impact Iraq's climate. They are essential in absorbing carbon dioxide, the primary contributor to the greenhouse effect. The annual absorption capacity of a single hectare of forest is around 140 kilograms of carbon dioxide. When multiplied by the millions of hectares of forested land, this represents a significant reduction in carbon dioxide emissions, which ultimately contributes to climate change mitigation.



Maintenance of Biodiversity and Life

Trees and shrubs vary in their appearance, genetics, and structure, making them one of the richest plant groups in genetic diversity in their environments. This diversity is due to local environmental conditions, differences in pollination conditions, and the synthesis of new genetic structures that serve biodiversity. Dates palms are one common example in Iraq, with more than 600 varieties according to scientific statistics and references, including the Iraqi guide of 1934. Some sources even suggest the existence of more varieties through hybridization and selection, similar to other forest trees. The availability of plant reserves and forests undoubtedly provides the opportunity to ensure the continuity, development, and increase of genetic diversity in ways that serve humanity in the future.

Maintenance of Water and Soil Resources

Trees play an effective role in distributing rainwater and reducing its kinetic energy. This role is enhanced positively with increased overall plant density. Soil properties improve due to reduced wind impact and the provision of organic matter that increases soil's water retention capacity. This leads to higher water absorption and reduces the impact of water flow (reducing the impact of floods), as well as activates soil microbes. Tree and shrub roots penetrating deep

into the soil break compacted layers, fragment rocks, and absorb minerals, pumping them to the soil surface. This allows continuous soil maintenance and rehabilitation. Trees planted in a certain engineered system act as windbreaks, reducing desert encroachment and land degradation, in addition to helping reduce soil erosion by over 55% and mitigating salinity and drought. They also extend the lifespan of dams used for water storage and improve water quality



The Tourism Aspect of Forests

The tourism potential of forests can be effectively harnessed to benefit the national income and the local population. Developing tourism based on the beauty of nature and the rich Iraqi heritage of archaeological sites and religious shrines will bring significant economic benefits. This kind of tourism is far more beautiful than its counterparts in European countries. Additionally, it can create new industries and professions, such as hunting, fishing, health resorts, medical and psychological treatment, away from pollution and noise.

Policy Alternatives: The Forests, Parks, and Green Belts Project

- Project Rationale

Given the importance of providing vegetative cover, stopping desertification, addressing the increasing recurrence of dust storms, and providing environmental, economic, social, and health solutions for the negative effects of climate change in Iraq which have short-term and long-term effects on climate, soil, and the human community, and reducing environmental pollution and lowering temperatures, such a project must be established.

- Project Location and Supporting Entities

The province and relevant stakeholders like the Directorate of Agriculture, Environment, and Water Resources are responsible for providing the infrastructure for the project, using agricultural land for establishing forests, parks, and agricultural nurseries and all their requirements. Other ministries

in the country are invited to cooperate and participate in this development project to achieve the desired goals.

- Project Requirements

Firstly, Material Requirements A. Agricultural nurseries to establish nurseries (provided in the first year of the project). B. Agricultural land in multiple locations to establish forests and parks (provided in the first year of the project). C. Technical requirements (wooden shades, plastic greenhouses, fertilizers, other chemicals such as pesticides, hormones, growth regulators, various seeds, agricultural machinery and equipment, basin and service cars, technical and service workshops, agricultural and industrial supplies, and more).

D. Financial allocations.

Secondly, Human Resources A. Advanced scientific staff (holders of higher degrees in plant specialists in forests, horticulture, crops, soil, and protection from agricultural engineers and irrigation, soil, and environmental engineers). B. Supporting scientific staff (holders of bachelor's and technical diplomas in plant specialists in forests, horticulture, crops, soil, and protection from agricultural engineers and irrigation, soil, and environmental engineers). C. Labor force (workers, temporary workers, etc.). D. Programming and spatial engineering specialists to prepare databases and maps. E. Afforestation and park specialists

Thirdly, implementing steps:

Year One:

- A. Develop scientific and applied plans related to the technical aspects and infrastructure of the project.
- B. Identify plant species suitable for propagation, considering their environmental resilience, growth rate, and vegetation cover.
- C. Prepare scientific studies to determine optimal propagation conditions, plant growth requirements, and maintenance.
- D. Commence planting, propagation, and production activities in nursery facilities while maintaining ongoing maintenance work.

E. Compile statistics and databases specific to each plant species, aligned with environmental requirements and remediation goals.

Year Two:

- A. Continue the activities from the first year, adapting to evolving circumstances and the latest scientific developments.
- B. Work on providing the technical requirements for plant transfer from nurseries to permanent sites.
- C. Collaborate with supporting organizations to prepare environmental designs and maps for implementation.
- D. Prepare scientific reports on achieved results and propose short-term and long-term prospects for project sustainability and success.

Year Three:

- A. Sustain and continue all previously achieved scientific and practical work from the previous two years.
- B. Prepare for the second phase of the project, including studies related to social, economic, and recreational aspects.
- C. Develop and document project-specific databases, transfer global technologies benefiting project work for broader applications in other provinces.



Years Four and Five:

- A. Continue scientific and technical activities as in previous years.
- B. Explore innovative initiatives related to establishing research, health, and recreational centers.
- C. Transfer the gained experience and knowledge to other provinces.

Alternative Desirability:

The derived benefits from this proposal will have a significant impact on the population, reducing dust storm effects, and lowering summer temperatures by at least 4-5 degrees Celsius over the next five years. This will also create opportunities for tourism resorts, parks, and healthcare facilities, leading to substantial economic returns, employment opportunities, development projects, timber production, beekeeping, handicrafts, and more. Additionally, it underscores Iraq's commitment to international agreements such as the Paris Agreement and national plans.

Conclusion:

Plant cover has significant positive effects on human life in various aspects, especially in contemporary times when it is crucial for influencing the climate and cooling Iraq. Therefore, encouraging afforestation, establishing forests, and reserves through a well-planned, long-term scientific approach is akin to reviving the idea of the green belt. It is not a new concept, and it is imperative for stakeholders, experts in state ministries, and the Iraqi people as a whole to reexamine previous files with a new scientific vision to rehabilitate natural forests and strive to establish green belts and parks within cities, aiming to achieve health and nutritional benefits, as well as job opportunities.



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