



Preparing Iraq to Cope with Natural Disasters Due to Climate Change: A Study of National Preparedness to Respond to the Impacts of Natural Disasters such as Floods and Drought. /A Review Article

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Abstract: This study aims to gain an insight into Iraq's preparedness to mitigate natural disasters triggered by climate change, specifically drought, floods, and dust storms. It explores the country's climatic issues, assesses the institutional and legislative framework that exists, looks into national disaster reduction plans, and identifies short- and long-term preparedness requirements. The study adopted a descriptive analytical approach based on a review of current literature and international and national reports related to climate change and disaster management in Iraq. It also depended on data and statistics from international organizations such as the World Bank, the United Nations Development Programme, and the United Nations Environment Programme, as well as on current Iraqi academic research. The article concludes that Iraq is faced with complex and interconnected challenges induced by climate change and that its national response is incomplete both in planning and implementation, despite having legislative foundations and early strategies. Institutional coordination weakness, financial and technical capacity weakness, and low awareness at the community level are the most apparent obstacles to formulating an effective and resilient response to disasters.



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Last but not least, the study emphasizes the need to adopt integrated sustainable policies that include infrastructure development, use of modern technology, regional and international cooperation development, and local capacity building in a bid to ensure effective responses to climate change and its associated disasters, hence ensuring the long-term security of Iraq's resources and people.

Keywords: Climate change, disaster management, national preparedness, natural disasters

1-Introduction: The majority of countries around the world are facing increased threats of climate change, and Iraq is among the nations becoming increasingly vulnerable to floods, droughts, sandstorms, and rising temperatures. These dangers are increasing with the deterioration of worldwide climate change, which requires a general national response to enhance the nation's resilience and ability to respond to imminent disasters (Al-Ani, 2023).

First: Climate Challenges Facing Iraq

1. Drought and Drying Water Resources: Iraq is one of the most drought-prone countries due to the sharp decline in the water level of the Tigris and Euphrates rivers as a result of climate change and the dam construction activities of upstream nations, coupled with declining annual rates of rainfall and poor management of local water resources (Al-Shammari et al., 2022). According to a report by the World Bank, Iraq could lose around 20% of its water resources by 2050 if immediate action is not taken (World Bank, 2021).

2. Torrents and Floods: Iraq has experienced a series of flash floods over recent years that have caused destruction to infrastructure and residential homes, particularly in rural areas. The incidence of the floods is caused by irregular weather patterns as a result of climate change, such as heavy short-duration rainfall and higher temperatures, which affect the soil and make it less efficient in terms of water absorption (Al-Saadi, 2023).

3. Dust and Sand Storms: The frequency of sand and dust storms has increased tremendously in Iraq, with the country registering more than 120 dust storms in 2022 alone, according to statistics from the Iraqi Ministry of Environment. This is caused by the degradation of vegetation cover, desertification, and the rise in temperature (Hassan, 2023). They are ranked as being among the most important environmental problems due to their impacts on public health, transport, and economic activity (UNEP, 2022).



Second: The Reality of National Preparedness

1. The Legal and Institutional Framework: There are numerous institutions in charge of disaster management and climate change that have been established by the Iraqi government, such as the Crisis Management Center connected to the General Secretariat of the Council of Ministers, the Ministry of Environment, and the Ministry of Water Resources. Despite the existence of this institutional framework, studies indicate that these institutions still face severe challenges related to weak coordination, insufficient financial and technical capabilities, and missing integrated action plans at the governorate level (Abdul Jabbar, 2023). Existing environmental laws are also weakly enforced and have no clear mechanisms of implementation (Mahmoud, 2022).

2. Disaster Reduction Strategies: Iraq has framed the "National Climate Change Adaptation Strategy" in 2021 and also became a signatory to the Paris Climate Agreement as its international commitment to green-house gas reduction. However, implementation of such strategies faces very formidable obstacles, including primary political instability, strict budgetary limitations, and deficiency in skilled technical human resources (UNDP, 2021). Partnerships with the private sector and civil society have been reported to be mobilized in terms of assisting in the implementation of climate programs (Ali, 2023).

3. Early Warning and Risk Management: Iraq's warning mechanisms are one of the least prepared aspects in the disaster response framework, relying considerably on traditional observing and not disposing of innovative equipment such as geographic information systems (GIS) and predictive models. This, as a consequence, renders their reactions slow, more so when faced with flooding or sandstorms (UNESCO, 2022). The lack of efficient coordination between governorates also makes sharing of information along with invoking the emergency steps mostly ineffective (Al-Azzawi et al., 2022).



Third: Building Preparedness Requirements

1. Infrastructure Development :Development of infrastructure is one of the most important measures in responding to the effect of climate change in Iraq, particularly through the construction of small and medium dams to reduce flash floods and conserve water during drought periods. Upgrading urban drainage facilities also reduces flash flood losses. A study conducted by Al-Dulaimi (2023) revealed that water harvesting projects could be a key contribution to the arid and semi-arid regions if supported by well-constructed local plans.

2. Technology Investment :There is a requirement for the Iraqi government to adopt state-of-the-art early warning systems and web geographic information systems (GIS) and climate analysis of data for proactive forecasting of disasters. It was established through a study by Ahmed et al. (2022) that use of climate prediction technology in Iraq remains negligible, with local communities remaining vulnerable to hazards due to lack of adequate alerting. Nevertheless, neighboring countries to Iraq, such as Jordan and Morocco, have used technologies to reduce their losses from disasters.

3. Building Local Capacity :Capacity building for the emergency response staff has been reported to be essential. These include civil defense units, municipal workers, and even volunteers of civil society. The significance of evacuation plans and disaster management awareness amongst people reduce the rate of casualties (Hussein, 2023). In its report, the United Nations Development Program (UNDP) recommended implementing frequent training sessions in risk-vulnerable Iraqi governorates (UNDP, 2021).

4. Regional and International Cooperation :Iraq cannot address climate challenges alone. Rather, it must attempt to increase regional collaboration with other nations to share resources and expertise, as well as technical and financial support from global organizations such as the World Bank and the United Nations Environment Programme (UNEP). Such collaboration has helped various developing countries finance green projects and obtain intelligent water and disaster management technologies (UNEP, 2022; World Bank, 2021).

Conclusion:

- 1- Iraq's increasing vulnerability to climate disasters: the study confirms that Iraq has become one of the world's most climate-sensitive countries in terms of droughts, floods, and dust storms and urgently needs national interventions to enhance its adaptation and resilience.
- 2- Existential danger in water shortage: The decline in the water levels of the Tigris and Euphrates rivers threatens Iraq's water security, especially with the continuity of climate change and the uneven water policies of the neighboring nations.
- 3- Recurrent floods and storms demonstrate poor infrastructure: The increase in flash floods and dust storms is evidence of poor urban planning as well as the absence of water control and soil stabilization projects.
- 4- Weak institutional and legislative framework, although institutions addressing climate change and disaster are available, they are characterized by poor



coordination, weak financial and technical capacity, and inefficient implementation of environmental laws.

- 5- The disaster mitigation strategies exist only in written documents: The government has established crucial strategies such as the National Adaptation Strategy and the Paris Agreement but is strongly hampered in execution by political instability, economic constraints, and weak capacity.
- 6- Weaknesses in early warning and risk management systems: Iraq lacks sophisticated warning systems based on data analysis techniques or geographic information systems (GIS), and therefore it is less likely to respond quickly to disasters.
- 7- The need to develop infrastructure and water projects: There is an urgent need to build small and medium-sized dams, improve urban drainage networks, and support water harvesting projects, particularly in arid and semi-arid regions.
- 8- Investment in technology is necessary: Current disaster forecasting technology and climate data analysis software should be replicated, similar to some nations in our neighborhood, who have succeeded in loss minimization by using technology.
- 9- Empowering local capacity is needed: Local capacities, in the form of civil defense officials, municipal staff, and civil society organization representatives, need to be trained, and citizens need to be educated in order to reduce human and material losses.
- 10- Role of International and Regional Support: Iraq cannot address climate concerns single-handedly. Instead, it must strengthen cooperation with countries in the region as well as international organizations to access knowledge, funding, and technology transfer.

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