حلول دائمة في العراق
Iraq Durable Solutions

Guidelines for Climate Resilience in Agriculture and Livelihoods - Iraq 2025

Acknowledgments

In line with the sustainable durable solutions in Iraq, the Climate Resilience of Livelihoods and Agriculture, consisting of individuals and organizations, collaborated to develop these guidelines to enhance climate change adaptation in the agriculture sector and improve livelihoods in Iraq. We extend our sincere appreciation to the government entities, organizations, and other stakeholders who contributed to supporting this work.

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Wishing Iraq a sustainable and bright future.

Thank you for your valuable contributions and continuous support.

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Objectives

- Develop comprehensive guidelines for climate resilience in Iraq's agricultural sector, addressing climate change and mitigating its impacts through the adoption of sustainable agricultural practices that respond to increasing climate challenges.

- Promote knowledge exchange, capacity building, and collaboration among farmers, NGOs, and government institutions to enhance climate resilience by providing the necessary knowledge for informed decision-making and modern technologies adoption.

- Provide innovative solutions for addressing climate risks through the implementation of participatory measures based on risk analysis, in collaboration with key agricultural and environmental agencies.

- Strengthen institutional stakeholders and partnerships by implementing participatory measures based on risk analysis, in collaboration with key agricultural and environmental agencies.

Introduction

Global warming is exacerbated by human activities that contribute to the emission of greenhouse gases such as carbon dioxide and methane. These emissions, resulting from various human activities, ultimately lead to long-term changes in climate systems worldwide. Among these effects are rising ambient temperatures, changes in drought frequency and rainfall patterns, rising sea levels, melting ice, and extreme weather events.[1]

Iraq ranks **61st** out of **163** countries on **UNICEF's Children's Climate Risk** Index and has been classified by the **United Nations' Global Environment Outlook 6 (GEO-6)** as the fifth most vulnerable country to extreme temperatures, water shortages, and food insecurity. These rankings reflect the significant climate risks faced by children in Iraq. The country is grappling with rising temperatures, declining rainfall, worsening droughts, water scarcity, sand and dust storms, and an expansion of arid land [2]. These climate shocks threaten Iraq’s stability and prosperity by increasing pressure on resources and reducing opportunities, particularly in the agricultural sector.

This crisis is further exacerbated by the existing socio-economic vulnerabilities of internally displaced persons **(IDPs)**, returnees, and host communities in Iraq. Additionally, water scarcity and poor water quality contribute to harm crop yields, rising its prices and disruptions in food systems, putting food security and livelihoods at risk.

[1] IRAQ CLIMATE IMPACT STUDY,NINEWA, ANBAR, KIRKUK, AND THE MARSHES by IRC
[2] MIGRATION, ENVIRONMENT,AND CLIMATE CHANGE IN IRAQ by IoM Iraq

Iraq's reliance on oil creates a **"conducive environment"** for climate crises. This dependence makes Iraq vulnerable to new economic risks as the world transitions away from fossil fuels [3].

The ongoing environmental changes are expected to become more severe, potentially forcing Iraqis to migrate for survival. Urgent and coordinated action is needed to address the challenges facing agriculture and livelihoods in Iraq amid climate change. These challenges directly impact farmers, rural communities, and the nation's food security. As temperatures rise, water becomes scarce and of lower quality, and soil degradation worsens. This makes it essential to develop climate-resilient strategies that enhance agricultural productivity and safeguard livelihoods.

To establish guidelines for enhancing climate adaptation in land use and economic income-generating practices in Iraq, it is crucial to understand how changes in rainfall and rising temperatures affect crop production, how farmers adapt to global warming, and the specific challenges faced by small-scale farmers. These guidelines should include mitigation and adaptation strategies that empower farmers to better cope with climate challenges, support sustainable agricultural practices such as modern irrigation techniques, the use of renewable energy, the cultivation of drought and salt-resistant crops, and crop rotation.

Implementing climate adaptation projects in Iraq's agricultural sector and improving livelihoods require structural reforms, training on climate impact management, and leveraging historical, political, and cultural contexts [4].[5] To develop effective climate adaptation plans for agriculture and livelihoods in Iraq by 2025, it is important to consider how land quality, agricultural practices, and human well-being are interconnected under climate change. These guidelines should focus on modern agricultural technologies, climate-smart strategies, efficient water resource management, and innovative farming techniques to help communities withstand climate challenges [6]. Sustainable agriculture and livelihoods must be strengthened through continuous efforts to restore degraded lands and implement measures to prevent future deterioration [7].

To successfully integrate livelihood factors into adaptation plans, communities- especially vulnerable- must be empowered to build adaptive systems that go beyond human-centered approaches and encourage a broader range of transformations. Climate resilience can be enhanced through a comprehensive, multi-sectoral approach that engages key actors from agriculture, environmental management, and

[3] Iraq Country Climate and Development Report by World Bank Group

[4] Towards farmers' livelihood resilience to climate change in Iran: A systematic review, Alireza Poursaeed, Masoud Bijani, Roya Eshraghi Samani, 01 Jul 2023-Environmental and sustainability indicators-pp 100266-100266.

[5] Climate Change Adaptation and Agricultural Livelihoods of Smallholder Farmers, Songdi Zhao1, 06 Jul 2022-pp 481-489

[6] Land Degradation Neutrality for Achieving Climate Resilience in Agriculture, 01 Jan 2022-pp 405-418.

[7] Enhancing resilience to climate change through prospective strategies for climate-resilient agriculture to improve crop yield and food security, Vasavi Rama Karri, Nirmala Nalluri, 24 Jun 2023

institutional sectors, ensuring that climate risk management in Iraq contributes to reducing conflicts [8].

1. Climate Projections [9]

- **Rising Temperatures:** Iraq's temperatures are expected to increase by **1.6 to 2.4°C** by **2030** compared to pre-industrial levels [10].
- **Declining Rainfall:** Average annual rainfall is projected to decrease by
- **9% by 2050**, leading to more frequent droughts and water shortages.
- **Droughts and Floods:** Iraq will experience longer and more intense droughts, alongside a decline in water quality due to climate change.

2. Key Climate Impacts

- **Agriculture:** Climate change will lead to a decline in agricultural production, increased desertification of arable land, and expansion of degraded land due to soil salinization and declining fertility.
- **Water Resources:** Reduced annual rainfall will strain water resources, leading to water scarcity and soil degradation.
- **Food Security:** Iraq will face major food security challenges due to declining agricultural productivity and the negative effects of climate change on crop yields and quality.
- **Public Health:** Poor air quality, increased CO_2 emissions, and limited access to clean water will have direct impacts on human health. Respiratory diseases will rise, particularly in high-density urban areas. Food shortages and outbreaks of diseases such as cholera will further weaken public health conditions.
- **Energy and Infrastructure:** The decline in water levels has led to a significant drop in hydropower electricity generation.

3. Key Climate Change Issues in Iraq [11]

- **Rainfall Decline:** Some regions in Iraq have experienced a **40%** reduction in rainfall levels.
- **Desertification:** Currently, deserts cover **40%** of Iraq's total land area, and this percentage is continuously increasing, with approximately **100 square kilometers** of agricultural land lost annually due to desertification.

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[8] Managing for resilience: a landscape framework for food and livelihood security and ecosystem services, Ian Bailey1, Louise E. Buck1, 27 May 2016-Food Security (Springer Netherlands)
[9] CLIMATE CHANGE RISK PROFILE Iraq by USAID
[10] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://weatheringrisk.org/sites/default/files/document/Climate_Risk_Profile_Iraq_8.pdf
[11] Climate Change Overview: Impacts, Mitigation, and Adaptation in Iraq

- **Agricultural Decline:** The shrinking of arable land and farmers abandoning their lands due to persistent drought conditions have resulted in insufficient agricultural production to meet national consumption needs.

- **Water Resource Depletion**: Groundwater levels are continuously declining, putting **7 million** Iraqis at risk, while over **20,000 individuals** have been displaced due to drought and other extreme climate conditions.

- **Record-Breaking Temperatures:** Temperatures exceeding **50°C** have become increasingly common in Iraq, including in Baghdad and other major cities. Severe heatwaves, sandstorms, and dust storms have disrupted daily life, causing medical emergencies and flight delays at airports, and over the past decade, dust storm days have increased from **243 to 272** annually, and this number is expected to reach **300 days** per year by **2050** due to global warming.

- **Soil Salinity Increase:** Rising salinity levels in central and southern Iraq are leading to the loss of **5%** of arable land annually. This results in **$300 million** in agricultural damages per year.

- **Surging Energy Demand and Carbon Emissions:** Electricity demand has surged by **46%** in recent years due to longer and hotter summers. Increased fossil fuel use and declining hydropower production have caused a **194%** rise in CO_2 emissions over the past two decades.

- **Migration and Displacement:** Drought, desertification, and declining agricultural productivity are forcing farmers to migrate in search of better economic opportunities.

4. The Impact of Climate Change on the Agricultural Sector and Farmers

The agricultural sector employs **20%** of Iraq's workforce, yet contributes only **4%** to the country's **GDP**, making it a distant second to the oil sector in economic importance. Iraqi agriculture is primarily small-scale, low-tech, and reliant on traditional, outdated methods with very low productivity. These systems are highly vulnerable to climate change, further limiting their ability to adapt or recover. In general, the specific impacts of climate change on the agriculture sector regardless of the underlying context can be summarized as follows:

Declining Agricultural Productivity: Climate change leads to reduced crop yield and quality due to soil degradation and water scarcity, negatively impacting farmers ability to produce enough to meet food demands.

Dependence on Seasonal Variability: Climate change disrupts planting schedules, reducing crop production and affecting traditional farming and harvesting techniques.

These challenges are worsened by rising temperatures, increased crop diseases, and pest infestations, all of which threaten crop health and productivity.

Livestock Sector: Rising temperatures and extreme drought increase heat stress and reduce livestock productivity, negatively impacting meat and dairy production. Additionally, water scarcity limits drinking water sources and grazing lands, further threatening livestock health. In southern Iraq, significant livestock losses have been reported, leading to the displacement of many families who depend on livestock for their livelihoods.

5. How Climate Change Affects Women Differently

Climate change directly impacts women's economic opportunities and livelihoods, particularly in agriculture, where they play a significant role. Women undertake physically demanding tasks such as planting crops, removing weeds, harvesting, and caring for livestock, while men typically handle marketing and purchasing. Additionally, water collection, food preparation, and maintaining home gardens are responsibilities primarily carried out by women. However, traditional norms and societal expectations do not support these employment opportunities, often restricting women's participation in agriculture.

The effects of displacement caused by ISIS-related terrorist activities have made it even harder for women to return to farming after being forced to stop. Women struggle to reintegrate into the labor market, unlike men, who can more easily find jobs in manual labor or construction. Furthermore, due to these conflicts, many people fled their farms, losing everything, including their livelihoods. This often leaves men with no choice but to take on temporary urban jobs, while women, left behind with their children, are unable to find opportunities or alternative ways to survive.

This situation has negative consequences on women's mental health, pushing them toward harmful coping strategies for survival. Women are also disproportionately affected by migration driven by climate change. For example, when families relocate, women may be socially excluded and struggle to find jobs in urban areas due to traditional customs. On the other hand, when men migrate for work, women are left to manage their households alone, further increasing their burdens and vulnerabilities.

6. How to Adapt to Climate Change [12]

Climate change adaptation involves developing strategies and actions that help individuals and communities adjust to changing weather patterns and overcome climate-related shocks. In recent years, many countries and local communities have begun implementing adaptation projects in response to increasing pressures from climate change.

These efforts aim to reduce the potential risks of environmental changes at national, regional, and local levels. Some initiatives focus on enhancing local capacities for analyzing and planning key responsibilities in a comprehensive manner, with the goal of strengthening the ability of stakeholders and organizations to cope with the anticipated consequences of climate change.

7. Considerations for Adaptation Choices

Identifying effective climate adaptation strategies requires considering several key factors, including:

1. Enhancing a deep understanding of both direct and indirect impacts on agricultural and rural systems within a specific context.

2. Integrating social, economic, and biological data to guide the design of programs and strategies.

3. Encouraging cross-sector collaboration, including agriculture, transportation, and water management.

4. Stimulating investment at various levels, from farming operations and local cooperatives to national institutions.

5. Evaluating and adjusting a range of adaptation strategies based on local conditions, such as transitioning to new agricultural techniques, strengthening institutional capacities, developing customized climate information services, establishing early warning systems, providing agricultural support services, implementing strong policies tailored to climate adaptation

Although many successful agricultural practices can help mitigate the effects of climate change, their ability to fully adapt remains limited without adequate preventive measures to ensure sustainable agricultural production. In this regard, the choice of adaptation strategies must be context specific. Global strategies that fail to consider local environmental, social, and economic conditions may lead to unintended consequences or worsen existing challenges.

[11] National Adaptation Plans Climate Resilience in Agriculture Building Climate Resilience in Agriculture

8. Recommendations [13]

Below are recommendations for national and international stakeholders, including relevant ministries, governmental institutions, and NGOs:

1. **Renew Irrigation Systems and Rehabilitate Agricultural Lands:** Facilitate the modernization of irrigation systems and land reclamation to ensure sustainable water use and combat soil degradation (salinization, reduced fertility, poor aeration, and structural decline). Small-scale solar-powered pumps can better meet farmers water needs due to their high efficiency and long lifespan.
2. **Enhance Water Management Technologies:** Despite the widespread use of drip irrigation, further promotion of sustainable water management techniques is essential. Which includes, rainfed agriculture, soil quality improvement, and the use of organic fertilizers to enhance biodiversity and reduce evaporation. Additional to rainwater harvesting, surface runoff management, and the cultivation of drought-resistant deep-rooted crops.

3. **Support the Adoption of Modern Agricultural Technologies:** Help farmers transition to efficient, resource-saving agricultural systems and technologies, while ensuring access to financial support to facilitate this transformation.
4. **Promote Sustainable Agricultural Practices:** Encourage long-term sustainable farming practices over traditional methods that prioritize short-term profits over sustainability, and support farmers in adopting climate-smart irrigation systems and investing in agricultural projects that enhance climate resilience.
5. **Financial Options for Sustainable Projects:** Establish financing options such as small grants and technical assistance to support sustainable outcomes, such as watershed management initiatives, and renewable energy solutions like solar-powered pumps.
6. **Capacity Building Through Agricultural Extension Services:** Strengthen farmers capacity-building efforts through extension services tailored to their specific agricultural challenges, particularly drought, and provide modern tools and training for implementing climate-smart agricultural practices.
7. **Enhance Farmer Participation in Decision-Making:** Encourage farmers to form platforms that amplify their collective voice in matters of accountability and decision-making. As NGOs should appoint legal advocates to support these associations and ensure gender equity in water management decision-making by involving women representatives.
8. **Support Agricultural Associations and Unions:** Strengthen farmer unions and associations, equipping them to actively participate in demand-driven decision-making and advocate for fair trade agreements and partnerships at all levels.

[13] Agriculture and climate change in Iraq by World Vision

9. **Build Trust Among Local Communities:** Organize awareness campaigns and national initiatives to boost consumer confidence in locally grown crops and products.
10. **Integrate Women in Decision-Making Processes:** Actively include women in agricultural decision-making and engage cultural influencers to redefine societal norms and reduce restrictions on women's roles in agriculture.
11. **Plan for Present and Future Needs:** Develop strategic plans that address both immediate challenges and long-term solutions to tackle the root causes of climate-related crises.
12. **Socio-Economic Development to Address Inequalities:** To reduce inequalities in Iraq, comprehensive social and economic development programs should be designed to bridge the growing gaps between different groups and communities.
13. **Increase Accountability and Transparency:** Enhance transparency and accountability in decision-making processes by ensuring the participation of national and local civil society organizations in response planning and implement audits and monitoring measures to ensure effective governance.
14. **Risk Assessments:** Conduct joint risk assessments to gain a better understanding of needs and challenges, ensuring data-driven responses to climate threats.

9. Climate-Resilient Agricultural Livelihoods Task Force in Iraq

The task force consists of key stakeholders and influential actors in the humanitarian sector in Iraq who have voluntarily expressed their willingness to participate. It also includes local and regional members from academic institutions with a strong focus on climate change adaptation issues.

The International Rescue Committee (IRC) leads the task force. Regular meetings will be held every three months, with additional meetings organized as needed. Invitations will be sent to all members at least one week before each meeting. Following each session, meeting minutes will be shared by the IRC or designated representatives.

9.1 Objectives of the Task Force

- **Identifying Key Stakeholders and Supporting Entities:** A stakeholder map and entities capable of supporting climate adaptation efforts, including climate change mitigation interventions, shall be identified. Furthermore, possible actions suitable for Iraq should be outlined.
- **Adopting National Adaptation Strategies:** A climate change adaptation strategy should be adopted at the national level, while eliminating agricultural policies and strategies that fail to integrate climate adaptation considerations.
- **Developing Adaptation Plans:** Climate adaptation plans should be developed, incorporating technical consultations with partners and providing

advisory support on collaboration with consultants to effectively address climate change related challenges.

- **Defining Work Areas for Task Force Members:** Identify specific areas where task force members can contribute to climate-related issues, enhancing coordination among key actors.
- **Bridging Perspectives:** Work towards achieving a shared understanding and guidance on climate adaptation efforts, ensuring coordination among members to achieve optimal outcomes.

9.2 Roles and Responsibilities of the Task Force

9.2.1 Technical Consultations

- Engage in ongoing discussions with relevant stakeholders, including government agencies, NGOs, volunteers, and climate experts.
- Conduct comprehensive assessments to identify and understand the challenges posed by climate change in Iraq, such as rising temperatures, water scarcity, and desertification.
- Standardize key climate-related messages as part of stakeholder communication efforts, ensuring clear messaging on challenges and solutions.
- Leverage expertise from technical specialists to provide insights into adaptation strategies, sustainable practices, and innovative solutions tailored to Iraq's context.

9.2.2 Partner Engagement

- Enhance effective collaboration with a wide range of partners, including local communities, research institutions, and international organizations.
- Facilitate knowledge exchange and best practices, and organize local initiatives, including awareness campaigns aimed at strengthening climate change adaptation.
- Strengthen and facilitate partnerships to effectively implement climate adaptation measures across various sectors and communities.

9.2.3 Capacity Building

- Collaborate with various stakeholders, including regional and local communities, international organizations, and research centers, to strengthen joint efforts in climate adaptation.
- Launch awareness campaigns and information-sharing initiatives with different groups to enhance their capacity to adapt to climate change by guiding them on effective response strategies and promoting cross-sector and cross-regional cooperation for more efficient adaptation technique.

9.2.4 Agricultural Climate Adaptation Plan

To effectively address climate change challenges in Iraq's agricultural sector, the International Rescue Committee (IRC), in collaboration with the Ministry of Agriculture, the Ministry of Environment, and the technical task force, will implement a climate-resilient agriculture plan. This initiative will engage ministries, departments, agencies, universities, NGOs, and development partners.

This comprehensive plan is designed to provide Iraq's crop production sector and key stakeholders with clear guidance to tackle serious climate-related challenges. The Agricultural Climate Adaptation Plan includes the following key objectives:

- Implement a participatory, risk-based climate action approach that effectively addresses climate uncertainties and risks, ensuring that sector policies and programs are aligned with future climate scenarios.
- Develop priority, time-bound, and cost-effective activities that align with the National Climate Change Strategy, focusing on strategic interventions in agriculture and food security.
- Identify opportunities for integrating climate adaptation and mitigation strategies into projects and scaling up existing initiatives to enhance resilience in the agricultural sector.
- Strengthen the institutional framework within the Ministry of Environment and agricultural cooperatives to effectively tackle climate change issues and improve coordination with the Iraqi government, NGOs, and non-governmental stakeholders.
- Conduct training sessions on risk mapping and analysis to support planning and decision-making processes related to climate adaptation.

9.2.5 Coordination

The Climate Adaptation Initiative aims to provide high-quality and effective support to agriculture and livelihood sectors in Iraq affected by climate change by strengthening the link between humanitarian and development efforts. This approach seeks to enhance the capacity of farming communities to adapt to climate changes by coordinating adaptation efforts among humanitarian agencies, government ministries (environment and agriculture), and other relevant stakeholders. This coordination includes:

- Developing operational and strategic guidelines.
- Providing specialized technical support.
- Enhancing the development of essential tools and resources.
- Integrating cross-cutting climate-related themes.
- Identifying gaps resulting from climate change impacts.

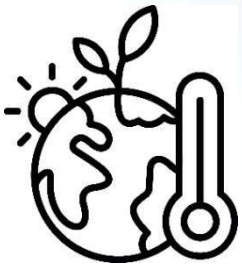
This approach aims to enhance climate resilience in the agricultural sector, ultimately improving living conditions for affected communities. It is crucial for government agencies and organizations involved in agriculture and climate change to join the Agriculture and Livelihood Improvement Group. By becoming members, stakeholders will have the opportunity to engage in dialogue, set priorities, and unify methodologies, leading to the effective use of global tools for enhanced cooperation and impactful results.

9.3 Guidelines for Enhancing Climate Change Adaptation

- **Climate Risk Assessment:** Conduct a comprehensive climate risk assessment for the specified location. This includes identifying potential risks such as droughts, floods, and rising temperatures, which impact agriculture and livelihoods.

- **Studying Shocks and Pressures:** Examine cases of environmental shocks and pressures to gain a better understanding of how these challenges affect agricultural communities and their livelihoods.

- **Mapping and Engaging Stakeholders:** This includes identifying key stakeholders and engaging decision-makers such as farmers, experts, policymakers, local communities, and NGOs to gather information from these parties regarding their experiences, the challenges they face, and their needs related to climate change adaptation in the agriculture and livelihood sectors.



- **Desk Research:** This involves researching available literature, including academic studies, scientific research, and effective methods for addressing climate change in agriculture and local economies. It also includes searching for success stories and collecting lessons learned from similar cases.

- **Identifying Priority Areas:** Determine priority areas for intervention based on climate risk assessments and stakeholder consultations. This includes formulating strategies and actions to enhance climate resilience in agriculture and livelihoods, increasing adaptation capacity in agriculture, designing capacity-building programs, and organizing awareness campaigns to empower farmers and communities to adapt flexibly to climate changes. Additionally, it includes training on climate-smart agriculture, risk management, and adaptation methods.

- **Developing a Monitoring and Evaluation Framework:** Establish a framework for monitoring the implementation of requirements and evaluating their long-term impacts. This includes setting precise key performance indicators (KPIs), creating data collection processes, and defining standards to track progress and identify areas needing further development.

- **Adaptation and Iteration:** Recognizing that climate resilience is an ongoing process that requires continuous adaptation and iteration. Therefore, guidelines should be reviewed and updated periodically based on climate changes, emerging challenges, and new insights from research and practice.

- **Feedback Loops:** Establish an effective feedback mechanism to assess the effectiveness of implemented actions and enable stakeholders to provide their opinions and suggestions to improve adaptation strategies.