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2025

Workshop Report

Environmental and Climate Changes Its Impact



جرين
للبيئة و المناخ و التنمية

GREEN FOR

ENVIRONMENT, CLIMATE & DEVELOPMENT

Workshop Report

Environmental and Climate Changes and Their Impact on Taiz Governorate

GREEN ORGANIZATION CORPORATE IDENTITY

GREEN Organization for Environment, Climate and Development

ABOUT US:

A local Yemeni non-profit organization specializing in the fields of environment, climate, and development. We strive to achieve environmental sustainability by integrating sustainable development into all our activities. We are committed to promoting environmental and climate awareness and achieving a balance between development needs and environmental and climate protection requirements. We are license No (36).

VISION:

Leadership in environmental, climate, and food security as sustainable development goals.

MISSION:

We strive to achieve leadership in environmental, climate, and food security by promoting innovation, while committing to contributing to a qualitative shift towards achieving sustainable development for future generations.

VALUES:

- Integrity
- Transparency
- Efficiency
- Partnership
- Equality
- Innovation



TABLE OF CONTENTS

A word of thanks	01
Executive Summary	02
Introduction	03
Summary of Welcome speech	04
Summary of speech by the First Deputy Governor of Taiz	05
Summary of speech by the FAO Project Coordinator	08
Working Paper: The Impacts of Climate Change on Agriculture	09
Working paper: Climate Change Impacts and Mitigation and Adaptation Measures	13
Working paper: Climate Change Impacts on Crop Production	19
Working paper: The Role of Organizations and the Private Sector in Mitigating Climate Impacts	22
Workshop Recommendations	28



1. A WORD OF THANKS

His Excellency the Governor of the Governorate, sponsor of the workshop "**Environmental and Climate Change and Its Impact on Taiz Governorate**" represented by the First Deputy Governor, His Excellency Mr. Dr. Abdul-Qawi Al-Mikhlafi.

Peace, mercy, and blessings of Allah be upon you.

We are pleased to present this report to you in appreciation of the great support and generous sponsorship you have provided for holding the workshop "Environmental and Climate Change and Its Impact on Taiz Governorate. "Your great interest and guidance have had a significant impact on the success of this meeting, which represents a practical step toward addressing the environmental and climate challenges in our beloved Taiz governorate.

We also extend our sincere thanks and gratitude to all the official bodies and partners who played an active role in preparing the working papers and enriching the discussion with their valuable suggestions, whether during the preparatory coordination meetings or during the workshop. We also appreciate their distinguished efforts in proposing creative and innovative solutions.

I would like, particularly, to thank:

- The Office of Planning and International Cooperation;
- The Office of Social Affairs and Labor;
- The Chamber of Commerce and Industry;
- The Food and Agriculture Organization (FAO);
- The United Nations Development Programme;
- The Office of Agriculture and Irrigation;
- The General Authority for Environmental Protection;
- The General Authority for Agricultural Research and Extension;
- The General Authority for Rural Water Projects;
- The Cleanliness and Improvement Fund.

And definitely, we salute the **GREEN Organization** team, who spared no effort to achieve the event's objectives and deliver it in the best possible way. We also extend our appreciation and gratitude to everyone who attended, contributed, and participated in the success of this workshop.

We hope this report will be the beginning of ongoing collaboration, and we are hopeful that efforts will be combined to translate the recommendations into tangible actions that will benefit Taiz Governorate.

May Allah blesses you and guides your steps on the path of righteousness and goodness.

Head of the Organization: Adnan NUMAN



2. EXECUTIVE SUMMARY

A workshop titled "Environmental and Climate Change and Their Impact on Taiz Governorate" was held in Taiz Governorate on Wednesday, April 30, 2025, under the generous patronage of the Governor of the Governorate. The workshop was represented by His Excellency the First Deputy Governor, Dr. Abdul Qawi Al-Mikhlaifi, and broad participation from representatives of government agencies, international and local organizations, environmental activists, and media professionals.

The workshop resulted in a set of strategic recommendations aimed at addressing the environmental and climate challenges facing the governorate. The recommendations focused on the following areas:

- **In the field of education and awareness:** The workshop recommended the integration of environmental concepts into school curricula and the organization of intensive awareness campaigns through various media outlets, with a focus on building teachers' capacities in this field.
- **In the context of preserving natural resources,** the recommendations emphasized the importance of establishing a specialized agricultural nursery to preserve the genetic makeup of endangered local plants, propagate drought-resistant varieties, and implement a precise biodiversity monitoring system.
- **In the field of waste management,** the workshop called for the establishment of an integrated recycling plant, requiring the use of biodegradable alternatives instead of plastic bags, and implementing a waste separation system at the source.
- **To combat climate change,** the workshop recommended that public and private establishments commit to measuring and reducing the carbon footprint of their operations, while encouraging the transition to renewable energy and adopting green building technologies.
- **In the field of water resources,** the recommendations emphasized the importance of implementing rainwater harvesting systems, developing and modernizing irrigation systems, and imposing strict oversight on the drilling of groundwater wells.

The workshop concluded by emphasizing the need to form a follow-up committee comprising all relevant stakeholders to ensure the implementation of these recommendations, while establishing clear mechanisms for evaluation and follow-up, and preparing periodic reports to measure progress made in implementing these initiatives.

The overall recommendations of the workshop represent a comprehensive roadmap for achieving sustainable development in the governorate. These recommendations will be submitted to relevant authorities for implementation.



INTRODUCTION AND METHODOLOGY



3. INTRODUCTION AND METHODOLOGY:

3.1 Scientific Background

Climate change is undergoing profound transformations globally, affecting weather patterns and temperatures and increasing the frequency of extreme weather events such as drought and floods. In Yemen, these challenges have been exacerbated by political and economic conditions, leading to the deterioration of natural resources and a decline in agricultural productivity.

In Taiz Governorate, for example, the effects are clearly in the following:

- **Water scarcity:** The groundwater level has declined due to excessive depletion, particularly for irrigating the qat crop, which consumes a high percentage of water resources.
- **Soil degradation:** As a result of desertification and erosion, the governorate has lost large areas of fertile land.
- **Decline in biodiversity:** The extinction of plant species such as basil and cloves, and the deterioration of the vegetation cover due to excessive logging.
- **Impacts on agriculture:** Declining crop productivity in some areas, and an increase in plant diseases.
- **The emergence of epidemic diseases:** Due to air pollution and waste accumulation, many epidemic diseases have emerged, such as cholera and lung diseases such as asthma, among others.



3.2 Workshop Objectives

1. To assess the environmental and climatic impacts on Taiz Governorate.
2. To discuss solutions and initiatives for adapting to climate change.
3. To enhance cooperation among relevant stakeholders to address environmental challenges.

3.3 Target groups:

1. **Government agencies:** Environmental Protection Authority, Agriculture and Irrigation Office, Rural Water Projects Authority, General Authority for Agricultural Research and Extension, Cleanliness and Improvement Fund.
2. **International organizations:** FAO - UNDP.
3. **Civil society:** Environmental associations, activists, media professionals.
4. **Private sector:** Taiz Chamber of Commerce and Industry.



3.4 Report Methodology:

The following methodology was adopted in preparing the report:

- **Previous studies:** Analysis of local and international reports on climate change in Taiz;
- **Focus groups:** With representatives of the entities participating in the workshop:
 1. Agriculture and Irrigation Office;
 2. General Authority for Environmental Protection;
 3. General Authority for Agricultural Research and Extension;
 4. General Authority for Rural Water Projects;
 5. Cleanliness and Improvement Fund.
- **Field Data:** Based on statistics on soil and water degradation, crop decline, plant and tree extinction, and the emergence of epidemic diseases resulting from environmental changes from the Agriculture Bureau and other international and local reports.
- **Critical Analysis:** Evaluating the effectiveness of implemented programs and suggesting improvements.

3.5 Target groups:

- **Government agencies:** the Agriculture Office, the Environment Public Authority, the Rural Water Authority, the General Authority for Agricultural Research and Extension, and the Cleanliness and Improvement Fund.
- **International organizations:** the FAO, the United Nations Development Programme.
- **Civil Society:** Environmental Institutions and Associations, Activists, Media Professionals.
- **Private Sector:** Taiz Chamber of Commerce and Industry



OPENING



4. OPENING:

4.1 Summary of the Welcome Speech

On behalf of the **GREEN** Organization, I welcome you all to this vital workshop that discusses environmental and climate change and its impact on Taiz Governorate.

A green greeting, full of determination and hope, is extended to all those present, especially His Excellency the Deputy Governor, our dear partners, and all the participating loyal people of Taiz.

We meet with you today on ancient land facing grave environmental challenges, from drought and floods to pollution and the extinction of biodiversity. But we are here to say: Enough! We are the generation of change, capable of transforming challenges into opportunities.

This workshop is not just a discussion, but the beginning of a comprehensive green transformation that will, God willing, transform the face of Taiz toward the aspirations of its people and supporters. Every constructive idea will be implemented, and every good suggestion will be followed up. I invite you to participate actively. Together, we will restore Taiz's glory and status and build a sustainable green future. Thank you.



Head of the Organization: Adnan NUMAN



4.2 Summary of the Speech of the First Deputy Governor of Taiz

In his opening remarks, Dr. Abdul Qawi Al-Mikhlafi praised the historical role of Taiz Governorate as a scientific, cultural, and civilizational center, emphasizing that this historical status imposes a double responsibility to preserve the environment. He also commended the role of the Green Organization in highlighting environmental and climate impacts, emphasizing the need for concerted efforts by all official and popular sectors to address the dangers of environmental and climate pollution that threaten health and the environment.

The first deputy governor called for the implementation of practical, applicable programs and the establishment of specialized organizations in the field of environment and climate change, pointing to the multiple challenges facing the governorate, especially with the increasing number of displaced persons and the lack of basic services. He affirmed the governorate's full readiness to support all efforts aimed at halting environmental and climate deterioration and preserving public health.

He also called on Taiz University, an extension of the governorate's scientific heritage, to coordinate with relevant authorities to conduct scientific studies and research that contribute to environmental protection. He emphasized the importance of establishing effective community partnerships in this field. He concluded by emphasizing that the Green Organization's specialization in the field of environment and climate represents a major gain for the governorate, calling for enhanced cooperation between all parties to address environmental and climate challenges.



4.3 Summary of the FAO Project Coordinator's Speech

During the workshop on environmental and climate change and its impact on Taiz Governorate, Dr. Abdul-Momen Shuja'uddin, FAO Project Coordinator in Taiz, delivered a speech in which he conveyed the greetings of the organization's Resident Representative, Dr. Hussein Jadin, and expressed his gratitude to the local authorities and civil society organizations, with special thanks to the **GREEN** Organization for Environment, Climate, and Development. He thanked the Food and Agriculture Organization of the United Nations (FAO) for its kind invitation to attend the workshop. He emphasized FAO's commitment to supporting community initiatives, noting the organization's intention to implement more projects in Taiz once funding becomes available, given the governorate's priority status in development intervention plans. He explained that Taiz is one of the leading governorates in its engagement with FAO programs, with its residents showing a positive response to the organization's initiatives.

During his speech, he reviewed FAO's most prominent interventions in Yemen, which focus on promoting sustainable agriculture and protecting resources through: promoting climate-smart agriculture, integrated pest management, establishing seed banks, and expanding modern irrigation systems. He also addressed two major projects:

- The Food Security Response Project (FSRRP), which includes Farmer Field Schools.
- A Global Environment Facility (GEF) project in three governorates that aims to preserve biodiversity.

In concluding his speech, he expressed his appreciation to the partners in this success, especially the Green Organization, emphasizing the alignment of these interventions with FAO's four global strategic pillars: (Better Production, Better Nutrition, Better Environment, and Better Life).



FAO Project Coordinator in Taiz: Abdul-Momen Shuja' Al-Din



WORKSHOP TOPICS



5. WORKSHOP TOPICS

5.1 Summary of the Working Paper: The Impacts of Climate Change on Agriculture in Taiz Governorate (Prepared by the team: Agriculture Office):

Introduction:

Climate change poses a major challenge to the agricultural sector in Taiz Governorate, negatively impacting agricultural productivity and natural resources. These impacts are manifested through increased drought severity, altered rainfall patterns, and rising temperatures, threatening food security and the sustainability of ecosystems.

The governorate faces additional challenges that exacerbate this problem, such as rapid population growth, uncontrolled urban sprawl, and unsustainable agricultural practices. These factors combined are leading to soil degradation, water scarcity, and shrinking agricultural areas.

This paper aims to analyze the impacts of climate change on agriculture in Taiz and offer practical solutions for adapting to these changes. It also seeks to raise awareness of the importance of sustainable agricultural practices, in line with local sustainable development goals.



Main Problems, Their Causes and Solutions:

1. Low Agricultural Production:

- **Causes:** Climate change, such as floods, drought, and strong winds.
- **Impacts:** Burying agricultural valleys, destroying terraces, and filling in irrigation canals.
- **Solutions:**
 - Implementing barriers to protect valleys;
 - Rehabilitating agricultural terraces and opening flood paths;
 - Constructing rainwater harvesting tanks.

2. Urban Expansion at the Expense of Agricultural Land:

- **Causes:** Population increase, real estate investment, and random construction.
- **Impacts:** Reduction of agricultural areas, environmental degradation, and increased pressure on infrastructure.
- **Solutions:**
 - Adopting vertical urban planning;
 - Establishing controls and standards for real estate investment;
 - Vertical expansion through construction rather than horizontal expansion.

3. Sand Dune Encroachment in Coastal Areas:

- **Causes:** Climate change (desertification, lack of vegetation cover), and strong winds.
- **Impacts:** Burying agricultural land, threatening villages and homes, and displacing populations.
- **Solutions:**
 - Establishing windbreaks and sand barriers;
 - Afforestation to stabilize the soil;
 - Planting forest trees such as jujube and frankincense.



4. Declining Vegetation Cover:

- **Causes:** Drought, overharvesting, few afforestation projects, and poor environmental awareness.
- **Impacts:** Soil degradation, loss of plant diversity (such as basil and carnations), and air pollution.
- **Solutions:**
 - Establish a nursery for rare plants and fruit trees.
 - Enact laws to prevent overharvesting.
 - Rainwater conservation.

5. Indiscriminate Use of Agricultural Pesticides:

- **Causes:** Lack of oversight, lack of awareness among farmers, and the proliferation of unlicensed pesticide shops.
- **Impacts:** Spread of diseases (such as cancer), water pollution, and harm to bees.
- **Solutions:**
 - Activate the role of agricultural extension to ensure safe use.
 - Establish laboratories to test pesticide residues in crops and water.
 - Raise awareness of the importance of organic pesticides extracted from plants.
 - Enforce regulatory laws, such as Pesticide Law No. 25 of 1999.

6. Spread of the Fall Armyworm and Other Harmful Nematodes:

- **Causes:** Indiscriminate use of pesticides and imported contaminated seeds.
- **Impacts:** Huge crop losses, reduced production, and financial losses for farmers.
- **Solutions:**
 - Educate farmers on the correct use of pesticides.
 - Continuously monitor plant growth stages.
 - Strengthen seed import controls.



7. Soil Nutrient Deficiency:

- **Causes:** Lack of awareness programs and limited environmental education.
- **Impacts:**
 - Pollution of water resources;
 - Destruction of ecosystems;
 - Decrease in agricultural productivity.
- **Solutions:**
 - Raise awareness of the importance of crop rotation;
 - Encourage planting during appropriate seasons;
 - Use of natural fermented fertilizers.

8. Lack of Environmental Awareness:

- **Causes:** Lack of awareness programs, limited environmental education.
- **Impacts:**
 - Continued environmentally harmful practices;
 - Difficulty implementing sustainable solutions.
- **Solutions:**
 - Incorporating environmental awareness into school curricula;
 - Organizing intensive awareness campaigns;
 - Involving local leaders in awareness-raising activities.

9. Soil Erosion:

- **Causes:** Heavy rainstorms, deforestation.
- **Impacts:** Loss of fertile topsoil, decreased land productivity.
- **Solutions:**
 - Applying water harvesting methods;
 - Establishing natural windbreaks;
 - Using contour farming techniques.



5.2 Summary of a Working Paper on the Impacts of Climate Change on Taiz Governorate And Mitigation And Adaptation Measures

(Prepared by the team: General Authority for Environmental Protection):

Introduction:

Taiz Governorate is suffering from serious repercussions resulting from rising temperatures, changing rainfall patterns, and the increased severity of extreme weather events such as floods and drought. These changes negatively impact vital sectors, especially agriculture, which represents the backbone of the local economy, and also affect the health and livelihoods of residents.

This paper aims to analyze the direct and indirect impacts of climate change on Taiz Governorate, focusing on the most affected sectors, such as agriculture, water, and health. It also highlights potential measures to adapt to and mitigate these changes by proposing practical, applicable solutions that draw on local resources and international expertise.

The importance of this paper stems from its provision of a scientific and practical framework that stakeholders can rely on to develop policies and make decisions to address climate challenges. The paper's methodology relies on an analysis of available data and the results of previous studies, in addition to the field experiences of environmental and agricultural workers in the governorate.

It also reviews international best practices in climate change adaptation, taking into account the specificities and potential of local conditions and its resources.



Main Problems, Their Causes and Solutions:

1. Rising Temperatures:

- **Causes:**
 - Greenhouse gas emissions (such as carbon dioxide); urban expansion and lack of green spaces.
- **Impacts:**
 - Increased incidence of heat stress and chronic diseases;
 - Declining agricultural production due to drought;
 - Increased energy consumption (use of air conditioners and fans).
- **Solutions:**
 - Planting trees in cities and increasing green spaces;
 - Installing fans in schools and public places;
 - Raising awareness of heatstroke prevention methods.

2. Floods and Torrents:

- **Causes:**
 - Changing rainfall patterns due to climate change;
 - Poor infrastructure (such as blocked flood drains).
- **Impacts:**
 - Destruction of agricultural land and infrastructure.
 - Displacement of populations and loss of property.
 - The spread of diseases (such as cholera) due to water contamination.
- **Solutions:**
 - Establish early warning systems to predict floods.
 - Clean flood channels and strengthen infrastructure.
 - Rehabilitate affected lands.



3. Declining Rainfall and Depleted Groundwater:

- **Causes:**
 - Climate change and changing rainfall patterns;
 - Excessive groundwater consumption for agriculture.
- **Impacts:**
 - Scarcity of drinking and irrigation water;
 - Declining agricultural production and increasing poverty.
- **Solutions:**
 - Rainwater harvesting and the construction of storage tanks;
 - Using modern irrigation techniques (such as drip irrigation);
 - Raising awareness about water conservation.

4. Spread of Climate-Related Diseases:

- **Causes:**
 - Water pollution due to floods;
 - High temperatures and the spread of mosquitoes.
- **Impacts:**
 - High mortality and morbidity rates;
 - Significant pressure on the health system.
- **Solutions:**
 - Improved medical waste management;
 - Vector control (such as mosquitoes) and water purification;
 - Health awareness of risks and prevention.



5. Greenhouse Gas Emissions from Various Sectors:

- **Causes:**
 - Use of fossil fuels in agricultural machinery and power plants;
 - Burn agricultural and industrial waste.
- **Impacts:** Aggravation of global warming and climate change.
- **Solutions:**
 - Switching to renewable energy (solar or wind);
 - Recycling waste and converting it into compost or biofuel.

6. Biodiversity Loss:

- **Causes:**
 - Excessive logging and destruction of natural habitats;
 - Urban expansion at the expense of green areas;
 - Pollution from chemical pesticides.
- **Impacts:**
 - Extinction of some rare plants (such as basil and carnation);
 - Ecological imbalance and impact on the food chain;
 - Loss of natural resources on which the population depends.
- **Solutions:**
 - Establishing nature reserves to protect threatened species;
 - Establishing agricultural nurseries to preserve the genetic heritage of plants and trees, especially those threatened with extinction;
 - Encouraging reforestation by planting local trees;
 - Regulating grazing and preventing excessive logging



7. Air Pollution:

- **Causes:**
 - Drought and irregular rainfall;
 - Crop destruction due to pests (such as fall armyworm);
 - Mismanagement of agricultural resources.
- **Impacts:**
 - Rising food prices;
 - Increased malnutrition rates;
 - Farmers migrating to cities
- **Solutions:**
 - Switching to renewable energy;
 - Implementing strict emission standards for factories;
 - Using modern waste treatment technologies.

8. Food Shortages and Widespread Famine:

- **Causes:**
 - Drought and irregular rainfall;
 - Crop destruction due to pests (such as fall armyworm);
 - Mismanagement of agricultural resources.
- **Impacts:**
 - Rising food prices;
 - Increasing malnutrition rates;
 - Farmers migrating to cities.
- **Solutions:**
 - Developing agricultural pest control programs;
 - Supporting farmers with modern agricultural techniques;
 - Establishing seed banks to preserve drought-resistant varieties



9. Accumulation of Waste in Streets and Waterways:

- **Causes:**
 - Inefficient waste collection systems;
 - Lack of environmental awareness among residents;
 - Lack of recycling facilities.
- **Impacts:**
 - Pollution of water sources and spread of diseases;
 - Clogged storm drains and increased flooding;
 - Deterioration of the aesthetics of cities.
- **Solutions:**
 - Establish waste recycling plants;
 - Organize public hygiene awareness campaigns;
 - Develop regular waste collection systems.

10. Road and Bridge Erosion Due to Floods and Torrential Rains:

- **Causes:**
 - Heavy, irregular rainfall;
 - Poor infrastructure design;
 - Lack of maintenance of public facilities.
- **Impacts:**
 - Disruption of transportation and trade;
 - Increased repair costs;
 - Putting the lives of residents at risk.
- **Solutions:**
 - Enhance infrastructure with climate-resistant materials;
 - Establish advanced drainage systems;
 - Implementation of strict building standards.



5.3 Summary of the Working Paper: The Impacts of Climate Change on Crop Production in Taiz Governorate (Prepared by the team: General Authority for Agricultural Research and Extension):

Introduction:

The working paper, "Environmental and Climate Change and Their Impact on Crop Production in Taiz Governorate," presents a comprehensive analysis of the interconnected challenges facing the agricultural sector, combining the effects of climate change on the one hand and the waste problem on the other, on the one hand, extreme climate events such as rising temperatures, changing rainfall patterns, and droughts have led to a significant decline in agricultural productivity, while improper waste disposal practices, such as burning or piling, have exacerbated the crisis by contaminating soil and groundwater and releasing toxic gases.

The study reveals the combined effects of these factors, including clogging of soil pores, salt accumulation, and penetration of harmful chemicals, leading to reduced yields and quality of strategic crops such as corn and coffee, the spread of agricultural pests, and a shrinkage of arable land. In the face of these challenges, the paper proposes a package of adaptive solutions, including the adoption of modern irrigation systems, the introduction of resistant plant varieties, the development of sustainable waste management mechanisms, and awareness programs for farmers, with the aim of enhancing the agricultural sector's resilience to these complex challenges.



Main Problems, Causes, and Solutions:

1. Declining Crop Productivity:

- **Causes:**
 - Rising temperatures and changing rainfall patterns; Increased droughts and floods;
 - Shrinking arable land; deteriorating soil fertility due to climate change.
- **Impacts:**
 - Decreased crop quality (e.g., altered coffee taste);
 - Increased agricultural product prices;
 - Decreased farmer income and increased poverty;
 - Threatened food security in agriculturally dependent countries
- **Solutions:**
 - Developing heat- and drought-resistant plant varieties;
 - Improving irrigation systems to rationalize water use;
 - Promoting climate-smart agriculture (such as shade-grown agriculture);
 - Supporting farmers financially and technically to adapt to climate change.

2. Environmental Pollution from Plastic and Solid Waste:

- **Causes:**
 - Poor waste management and lack of effective recycling systems;
 - Incineration of plastic waste;
 - Excessive consumption of plastic materials.
- **Impacts:**
 - Soil, water, and air pollution;
 - The spread of diseases (such as cancer and respiratory diseases);
 - The decline of biodiversity.
- **Solutions:**
 - Establish waste recycling plants;
 - Prohibit the burning of plastic waste;
 - Enforce the use of environmentally friendly alternatives.



3. Biodiversity Loss:

- **Causes:**
 - Poaching and deforestation
 - Nature destruction because of extension
 - Environmental pollution.
- **Impacts:**
 - Extinction of plant and animal species;
 - Ecological imbalance;
 - Decline in ecotourism.
- **Solutions:**
 - Establishing nature reserves;
 - Strengthening penalties for poaching;
 - Raising awareness of the importance of preserving biodiversity.

4. Deterioration of Traditional Irrigation Systems:

- **Causes:**
 - Neglect of regular maintenance of earthen dams and irrigation canals;
 - Erosion of agricultural terraces due to flash floods;
 - Old systems not keeping pace with modern agricultural requirements;
 - Lack of funding for rehabilitation.
- **Impacts:**
 - The loss of large areas of irrigated land over the past decade;
 - Rising irrigation costs for farmers;
 - Increased consumption of groundwater as an alternative to rainwater;
 - Significant decline in crop productivity.
- **Solutions:**
 - A national program for the rehabilitation of agricultural terraces;
 - Using modern irrigation techniques (drip, sprinkler);
 - Building rainwater harvesting tanks;
 - Developing an early warning system for floods



5.4 Summary of the Working Paper on the Role of Organizations and the Private Sector in Confronting the Impact of Environmental and Climate Change on Taiz Governorate (Prepared by the team: GREEN Organization for Environment, Climate, and Development):

Introduction:

As part of efforts to address the environmental and climate challenges facing Taiz Governorate, this scientific paper highlights the pivotal roles of local and international organizations and the private sector in addressing these challenges. Climate change poses an existential threat to the governorate's natural resources and livelihoods, requiring urgent and coordinated intervention from all stakeholders.

This analytical paper reviews the reality of environmental challenges in Taiz Governorate, focusing on three main pillars:

-First, a critical assessment of the roles of international organizations in providing technical and financial support.

-Second, an analysis of the contributions of civil society organizations to the implementation of field projects.

-Third, a review of opportunities and areas for private sector intervention in adopting sustainable practices.

The paper also presents an integrated framework for overcoming the common challenges facing these parties by strengthening effective partnerships, adopting innovative solutions, and developing sustainable mechanisms for adapting to climate change. The paper concludes with a set of practical recommendations aimed at transforming challenges into opportunities for sustainable development, ensuring the building of more resilient societies capable of facing climate challenges.

This paper serves as a scientific and practical contribution to enriching the debate on ways to address climate change, striving to achieve environmental balance and sustainable development in Taiz Governorate.



Main Problems, Their Causes, and Solutions:

1. Limited Funding and Resources:

- **Causes:**
 - Local organizations' reliance on unstable external funding;
 - Lack of financial support from the local government;
 - Competition for resources between different sectors.
- **Impacts:**
 - Insufficient project implementation;
 - Poor sustainability of existing projects;
 - Declining capacity to respond to emergency needs.
- **Solutions:**
 - Establish a sustainable local funding fund;
 - Strengthen partnerships with the private sector;
 - Diversify international funding sources.

2. Security and Administrative Difficulties:

- **Causes:**
 - Political and military unrest;
 - Complex bureaucratic procedures;
 - Difficulty accessing affected areas.
- **Impacts:**
 - Project implementation delays;
 - High labor costs;
 - Limited geographic coverage.
- **Solutions:**
 - Pre-coordination with local authorities;
 - Simplification of administrative procedures;
 - Using alternative communication methods.



3. Weak Institutional Coordination:

- **Causes:**
 - Lack of a clear framework for the distribution of roles;
 - Lack of a unified information system;
 - Multiplicity of actors without an effective coordination mechanism.
- **Impacts:**
 - Duplicate efforts between international and local organizations;
 - Poor integration of private sector initiatives;
 - Waste of available resources.
- **Solutions:**
 - Establish a digital coordination platform;
 - Develop a clear map for the distribution of roles;
 - Conduct quarterly planning meetings.

4. Lack of Technical Capacity in the Field of Environment and Climate:

- **Causes:**
 - Limited local qualified personnel;
 - Lack of technical equipment;
 - Weak knowledge transfer programs.
- **Impacts:**
 - Local organizations' reliance on external expertise;
 - Difficulty implementing projects of international organizations;
 - Limited private sector innovations.
- **Solutions:**
 - Specialized training programs;
 - Local centers of excellence;
 - Partnerships with universities.



5. Weak Community Participation:

- **Causes:**
 - Low environmental awareness;
 - Lack of community involvement in planning;
 - Lack of local incentives.
- **Impacts:**
 - Limited impact of awareness programs;
 - Difficulty in project sustainability;
 - Weak community engagement with initiatives.
- **Solutions:**
 - Interactive awareness campaigns;
 - Participatory local councils;
 - Incentive programs

6. Insufficient Environmental and Climate Data:

- **Causes:**
 - Lack of environmental monitoring systems;
 - Limited field studies;
 - Poor documentation of experiments.
- **Impacts:**
 - Difficulty in project planning;
 - Poor impact assessment;
 - Limited applied research.
- **Solutions:**
 - Establish a local climate observatory;
 - Establish a geographic information system;
 - Documentation of successful environmental and climate practices.



7. Limited Private Sector Investment in Environmental Projects:

- **Causes:**
 - Lack of adequate economic incentives;
 - High costs of investing in green technologies;
 - Lack of guarantees against climate risks.
- **Impacts:**
 - Weak corporate participation in climate adaptation solutions;
 - Continued polluting industrial practices;
 - Loss of green development opportunities.
- **Solutions:**
 - Stimulus packages (tax breaks, concessional financing);
 - Climate risk insurance;
 - Public-private partnerships for major projects.

8. Unsustainable Industrial Practices:

- **Causes:**
 - Adoption of outdated, polluting technologies;
 - Non-compliance with environmental standards;
 - Lack of effective oversight.
- **Impacts:**
 - Worsening industrial pollution;
 - Depletion of natural resources;
 - Deterioration of public health.
- **Solutions:**
 - Requiring the private sector to modernize environmentally friendly industrial assets;
 - Establishing a regulatory system to enforce compliance with the carbon footprint of facilities;
 - Establishing a government center to provide support for the transition to green energy.



9. Weak Innovation in Environmental Solutions:

- **Causes:**
 - Lack of local research and development;
 - Limited access to modern environmental technologies;
 - Lack of green business incubators.
- **Impacts:**
 - Reliance on ineffective traditional solutions;
 - Loss of competitive opportunities;
 - Weak private sector contribution to climate innovation.
- **Solutions:**
 - Establishing green business incubators;
 - Partnerships with research centers;
 - Announcing environmental innovation competitions.

10. Deficiencies in Corporate Social Responsibility:

- **Causes:**
 - Lack of environmental culture among companies;
 - Failure to integrate the environmental dimension into strategies;
 - Weak social accountability mechanisms.
- **Impacts:**
 - Limited voluntary environmental programs;
 - Loss of community trust;
 - Poor corporate reputation.
- **Solutions:**
 - Mandatory annual environmental reporting;
 - Awareness programs for executives;
 - Awards for environmental excellence.



WORKSHOP RECOMMENDATIONS



6. WORKSHOP RECOMMENDATIONS

Importance of the Workshop Recommendations and Proposals

The recommendations contained in this report constitute a strategic roadmap for addressing the environmental and climate challenges facing Taiz Governorate, representing an integrated framework that combines immediate solutions with long-term strategies.

The importance of these recommendations stems from their comprehensiveness and applicability, covering all vital aspects, from community awareness to institutional policies and innovative technical solutions. These recommendations are based on three main axes:

- Enhancing environmental awareness by empowering educational and media institutions.
- Developing sustainable infrastructure through clean energy projects and water resource management.
- Strengthening partnerships between all stakeholders, including international and local organizations, the private sector, and civil society.

These recommendations are particularly important in the context of Taiz Governorate, given the worsening climate challenges that threaten water and food security.

Climate adaptation and natural resource management programs are a top priority.

The focus on empowering women and youth in these recommendations ensures the sustainability of the results and instills an environmental culture in future generations.

Effective implementation of these recommendations requires institutional commitment from all parties, the allocation of adequate resources, and the establishment of periodic monitoring and evaluation mechanisms. Their success also depends on our ability to transform them into practical, measurable policies and procedures, taking into account local specificities and the exceptional circumstances facing the governorate.

In conclusion, these recommendations represent a real opportunity to achieve a qualitative shift in addressing environmental challenges and transforming them into opportunities for sustainable development, ensuring a more secure and stable future for the people of Taiz Governorate.



First: Recommendations for Organizations and the Private Sector:

1. Environmental education and awareness:

- Integrating students into environmental activities such as afforestation;
- Encouraging environmental education initiatives (such as best environmental project competitions) in schools;
- Building teachers' capacities in environmental programs;
- Implementing environmental awareness campaigns in schools and the community through media programs (television, radio, and social media platforms);
- Developing an environmental book and integrating it into the curriculum;
- Encouraging environmental innovation through green business incubators.

2. Sustainable projects and scientific research:

- Encouraging environmental projects (clean energy, recycling);
- Establishing research centers in partnership with universities to study the impact of climate change on Taiz;
- Evaluating the interventions of environmental organizations to ensure their effectiveness;
- Attracting green investments to support renewable energy (solar energy, wind);
- Implementing climate-smart agriculture (such as vertical farming or hydroponics).

3. Water Resources Management:

- Regulating the drilling of artesian wells and enforcing strict oversight;
- Preserving and rehabilitating existing water sources;
- Desalinating water using available sources;
- Establishing rainwater harvesting facilities (dams, ponds, barriers).



Second: Recommendations for the Sanitation Fund:

1. Waste Management:

- Recycling waste and establishing a specialized factory;
- Prohibiting the use of plastic bags and imposing biodegradable alternatives;
- Installing smart waste containers in residential neighborhoods;
- Implementing incentive programs for households that adhere to waste separation;
- Relocating the current landfill to an environmentally friendly site away from residential areas.

2. Community Participation

- Involving youth in volunteer teams to monitor cleanliness;
- Implementing "Green Weeks" to clean neighborhoods.

3. Green Energy: Operating water projects with solar energy.

Third: Recommendations of the Agriculture and Research Group:

1. Preserving Agricultural Diversity:

- Establishing a nursery and genetic repository for threatened plants;
- Propagating drought-resistant crops (cereals, vegetables);
- Introducing genetically modified drought-tolerant crop varieties;
- Addressing the effects of the partial leaf fall of Gharib tree.

2. Improving agricultural practices

- Encouraging the use of organic fertilizers and natural fertilizer (compost).
- Providing devices to measure pesticide residues in the soil.
- Enforcing agricultural laws (such as Pesticide Law No. 25 of 1999).



3. Water Resources Management

- Disseminating modern irrigation techniques (drip irrigation, networks).
- Installing water meters for farmers to rationalize consumption.
- Requiring farmers to use smart irrigation systems such as sensitive faucets.
- Requiring restaurants, buffets, mosques, public bathrooms, and homes to use smart faucets.
- Restricting qat cultivation to protect groundwater.

4. Community Empowerment

- Training farmers in hydroponics.
- Activating the role of rural women in decision-making.

Fourth: Recommendations of the Special Focus Group on the Environment:

1. Monitoring and Legislation:

- Providing climate change monitoring and early warning devices.
- Enforcing the Environmental Protection Law and imposing fines on violators.
- Requiring factories to treat their waste before disposal.

2. Green Initiatives:

- Establishing nature reserves to preserve biodiversity.
- Encouraging the cultivation and rehabilitation of mountain terraces.
- Using ablution water from mosques to irrigate street trees.

3. Waste Management:

- Source separation of waste (organic, solid, hazardous).
- Safe disposal of medical waste.



4. Urban Planning:

- Vertical rather than horizontal urban expansion to preserve agricultural land.
- Building sustainable, environmentally friendly cities

Fifth: General Recommendations:

1. The Role of Media and Civil Society

- Producing awareness programs through local media.
- Empowering environmental organizations with training and funding.

2. Adapting to Climate Change

- Improving infrastructure to combat floods (rainwater drainage).
- Monitoring diseases associated with climate change (such as malaria, etc.)





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