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CLIMATE RESILIENCE FOR MARMARA REGION

LONG-TERM ADAPTATION AND ACTION PLAN FOR THE MARMARA REGION OF TÜRKİYE

PRESENTATION 2025

START NOW

More Information
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ECLIMATE ADAPTATION AND MITIGATION ACTION PLAN FOR THE MARMARA REGION OF Türkiye

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INTRODUCTION: CLIMATE CHALLENGES IN MARMARA

- Urban heat islands intensify with rising temperatures
- Flash floods and coastal inundation from extreme rainfall and sea level rise
- Threats to health, infrastructure, energy, and ecosystems
- Urgent need for integrated, long-term adaptation strategies

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CLIMATE IMPACTS AND ADAPTATION STRATEGY FOR THE MARMARA REGION

OBSERVED CLIMATE CHANGES IN THE MARMARA REGION

Rising Temperatures

- Significant increase in average temperatures over recent decades.
- Notably hotter summers intensified by the urban heat island effect.

Changing Precipitation Patterns

- Decline in overall winter rainfall.
- Increase in intense, short-duration rainfall events, contributing to flash flooding and overburdened drainage systems.

Sea Level Rise

- Gradual inundation of low-lying coastal areas.
- Increased coastal erosion and saltwater intrusion affecting freshwater and infrastructure.

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KEY IMPACTS ON URBAN SYSTEMS

Energy Demand

- Rising need for cooling in buildings due to hotter summers.
- Strain on electricity grids and increased energy consumption.

Public Health Risks

- Higher incidence of heat-related illnesses and worsening air quality.

Flood Vulnerability

- Greater risk of urban flash floods damaging property and infrastructure.

Infrastructure and Heritage at Risk

- Coastal infrastructure and cultural heritage sites threatened by erosion and flooding.

Stress on Urban Systems

- Increased pressure on transport, waste management, and urban sustainability frameworks.

SECAP STRATEGIC RESPONSE

Integrated Long-Term Adaptation Approach

Focused on urban resilience through adaptation strategies in key areas:

- **Urban heat island mitigation**
- **Flood risk management**
- **Sustainable energy transition**
- **Climate-resilient transportation**
- **Efficient waste management**
- **Public health protection**

Concrete Implementation Steps

- **Specific actions and projects tailored to Marmara's vulnerabilities.**

Supportive Institutional Framework

- **Coordination across sectors and governance levels to support implementation.**

Alignment with National and Global Goals

- **Contributes to Türkiye's climate commitments and sustainable development objectives.**

URBAN HEAT ISLANDS INTENSIFY WITH RISING TEMPERATURES

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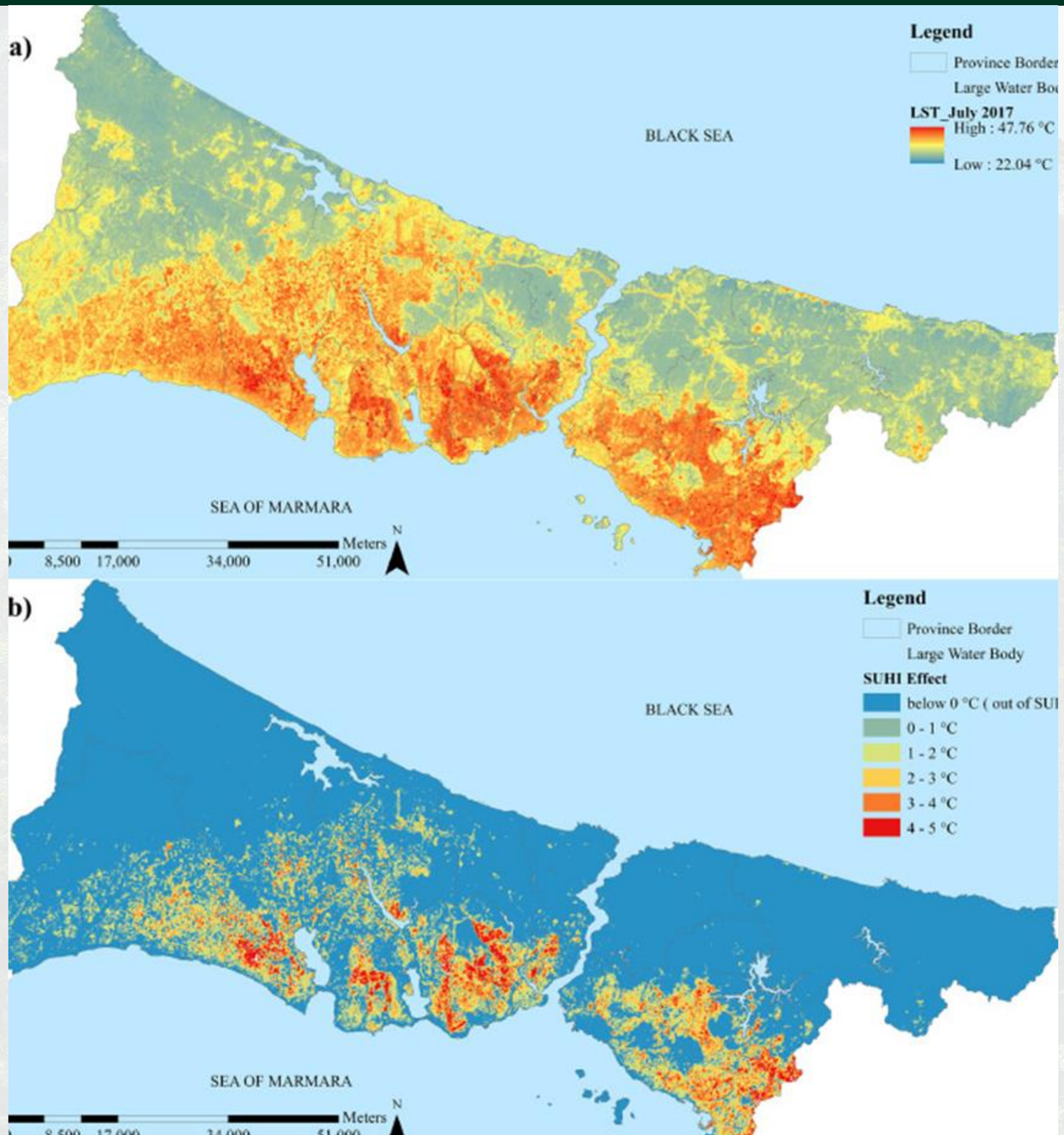

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OUR VISION

To build resilient, livable, and low-carbon cities across Marmara by 2050, in alignment with Türkiye's National Climate Strategy and 2053 Net-Zero Goal.

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PRIORITY AREAS OF ACTION

1. Urban Heat Island and Heatwaves
2. Flood Risks and Sea-Level Rise
3. Sustainable Energy
4. Climate-Smart Transport
5. Waste Management
6. Public Health and Social Resilience

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ADAPTATION ACTIONS: URBAN HEAT ISLAND

- Expand Urban Green Infrastructure
- Promote Reflective and Permeable Urban Surfaces
- Update Urban Planning to Improve Shading and Ventilation
- Enhance Heat-Resilient Building Design
- Integrate Water Features in Urban Design
- Implement Community-Based Heat Action Plans
- Deploy Urban Temperature Monitoring Networks

Enforce Regulatory Measures for Climate-Responsive Construction

KeyInstitutionsforCooperation

- Municipalities and Local Government Authorities
- Ministry of Environment and Urbanization
- Urban Planning and Zoning Departments
- Regional Environmental Directorates (Marmara Regional Offices)
- Local Universities and Research Institutes
- Civil Society Organizations and NGOs
- Forestry and Landscaping Agencies

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FLOOD RISKS: EXTREME RAINFALL AND SEA LEVEL RISE

FLOOD AND COASTAL ADAPTATION

- Upgrade Stormwater Infrastructure and Drainage Systems
- Implement Nature-Based Runoff Management Solutions
- Deploy green infrastructure such as bioswales, rain gardens, and restored wetlands to absorb runoff, reduce flood intensity, enhance biodiversity, and improve urban aesthetics through pilot projects like “Blue-Green Boulevards.
- Construct and Evaluate Structural Flood Defenses
- Build levees, seawalls, and living shorelines to protect against coastal and riverine flooding.
- Integrate Flood-Resilient Land Use and Zoning Policies
- Banning new construction in flood-prone areas unless flood mitigation measures are in place.
- Convert high-risk zones into parks or other low-impact uses and mandate flood risk disclosures in real estate transactions.

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FLOOD RISKS: EXTREME RAINFALL AND SEA LEVEL RISE

FLOOD AND COASTAL ADAPTATION ACTIONS

- **Enhance Coastal Protection Against Sea Level Rise and Salinization**
- **Install sea walls and tide barriers to defend against rising seas and saltwater intrusion into freshwater systems, securing coastal settlements and critical infrastructure.**
- **Strengthen Flood Forecasting and Early Warning Systems**
- **Promote Community-Based Flood Preparedness and Emergency Response**
- **Support Climate-Smart Building Retrofits and Relocation**
- **Provide incentives such as subsidies to elevate existing homes, install flood gates or pumps,**
- **Where necessary—facilitate relocation from high-risk zones to reduce long-term vulnerability.**

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KEY INSTITUTIONS FOR COOPERATION IN THE MARMARA REGION

- Ministry of Environment and Urbanization (MoEU)
- AFAD (Disaster and Emergency Management Authority)
- Municipalities
- Ministry of Agriculture and Forestry (MoAF)
- Coastal and Maritime Safety Agency (KEGM)
- Ministry of Interior (for Local Governance and Emergency Services)
- Public and Private Sector Engineering Firms
- Local Universities and Research Institutes

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SUSTAINABLE ENERGY AND BUILDING DESIGN

- Retrofit Existing Buildings to Improve Energy Efficiency
- Mandate Energy Efficiency in New Constructions via Green Building Codes
- Adopt and enforce updated Green Building Codes
- Expand Solar and Renewable Energy Adoption through the “Solar City” Initiative
- Install rooftop solar panels on public facilities and incentivize private-sector investment in solar PV and wind systems, reducing fossil fuel dependence and emissions.
- Implement Smart Grid Technologies and Battery Storage Systems
- Explore and Pilot District Energy Systems for Heating and Cooling.
- Strengthen Physical Resilience of Energy Infrastructure
- Establish a Regional Energy and Emissions Monitoring Center.
- Raise Public Awareness and Incentivize Energy-Saving Behaviors
- Conduct targeted education campaigns.

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KEY INSTITUTIONS FOR COOPERATION

- Ministry of Energy and Natural Resources
- Ministry of Environment and Urbanization
- TEİAŞ (Turkish Electricity Transmission Corporation)
- Electricity Distribution Companies
- Municipalities and Local Governments
- Urban Planning and Building Regulation Agencies
- Local Universities and Research Institutes
- Private Sector Energy Companies and Developers

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SUATAINABLE CLIMATE-SMART TRANSPORT SYSTEMS ADAPTATION ACTIONS

- Upgrade Transport Infrastructure Design Standards for Flood, Heat, and Extreme Weather Resilience
- Expand and Enhance Public Transit and Active Transport Networks
- Accelerate the Transition to Low and Zero Emission Vehicles
- Integrate Transit-Oriented Development (TOD) into Land Use Planning
- Implement Transportation Demand Management Measures
- Strengthen Port and Logistics Resilience Against Climate Hazards
- Conduct Infrastructure Climate Audits

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- **Advance Metro and Rail Expansion Projects with Climate-Resilient Features**
- **Convert Municipal Bus Fleets to Electric Vehicles and Build EV Charging Networks**
- **Develop Protected Bike Lanes, Pedestrian Zones, and Redesigned Urban Streets**
- **Enact Policy Incentives (e.g., Congestion Charges and Low Emission Zones)**
- **Establish Emergency Transport and Evacuation Protocols**

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KEY INSTITUTIONS FOR COOPERATION IN THE MARMARA REGION

- Ministry of Transport and Infrastructure
- Ministry of Environment and Urbanization
- Municipalities and Local Government Authorities
- TEİAŞ (Turkish Electricity Transmission Corporation) and Electricity Distribution Companies
- Transport and Infrastructure Planning Agencies
- Port Authorities and Logistics Organizations

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SUSTAINABLE WASTE MANAGEMENT ADAPTATION ACTIONS

- Promote Waste Reduction, Recycling, and Composting Practices
- Install Methane Capture Systems and Evaluate Waste-to-Energy Processes
- Design Waste Collection and Disposal Facilities to Withstand Floods
- Enhance Wastewater Treatment and Encourage Reuse
- Drive Public Engagement and Behavior Change Toward Proper Waste Management
- Investigate Innovative Waste Management Technologies
- Develop a Regional Waste Management Strategy with Clear Targets
- Invest in New Material Recovery Facilities (MRFs) and Composting Plants

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- **Upgrade Landfill Sites with Methane Capture and Improved Leachate Management**
- **Modernize Waste Collection Fleets and Optimize Routes**
- **Organize Emergency Debris Removal Protocols and Regular Infrastructure Inspections**
- **Launch Community “Zero Waste Neighborhood” Programs**

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KEY INSTITUTIONS FOR COOPERATION IN THE MARMARA REGION

- Ministry of Environment and Urbanization
- Municipalities and Local Government Authorities
- Waste Management Companies and Operators
- Regional Water and Waste Management Authorities
- Private Sector (MRF Operators, Technology Providers)
- Universities and Research Institutes
- Non-Governmental Organizations (NGOs) and Community Groups

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ADAPTATION ACTIONS FOR PUBLIC HEALTH AND SOCIAL RESILIENCE

- Develop Comprehensive Heat Health Action Plans with Early Warning and Cooling Measures
- Strengthen Disease Surveillance and Vector Control to Counter Emerging Health Threats
- Enhance Healthcare Facility Resilience (Backup Power, Flood Proofing, Robust Cooling Systems)
- Provide Mental Health Support and Community Resilience Programs in Disaster-Prone Areas
- Implement Public Education Campaigns on Health, Water/Food Safety, and Climate Risks
- Ensure Inclusive Planning that Prioritizes Vulnerable Populations and Equity in Health Services

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- **Establish Heatwave Early Warning and Response Systems**
- **Upgrade Disease Surveillance Platforms with Integrated Climate Health Data**
- **Conduct Climate Resilience Assessments in Hospitals and Retrofit Healthcare Facilities**
- **Prepare EMS for Climate Extremes by Upgrading Equipment and Training Personnel**
- **Expand Community Health Outreach (e.g., Climate Health Volunteers, School Curricula)**
- **Form Climate and Health Working Groups at Local Levels**

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KEY INSTITUTIONS FOR COOPERATION

- Ministry of Health (T.C. Sağlık Bakanlığı)
- Ministry of Environment, Urbanization and Climate Change (T.C. Çevre, Şehircilik ve İklim Değişikliği Bakanlığı)
- Turkish State Meteorological Service (Meteoroloji Genel Müdürlüğü)
- Provincial Health Directorates (Istanbul, Kocaeli, Bursa, Tekirdağ, Sakarya, Balıkesir, Yalova, Edirne, Çanakkale)
- Disaster and Emergency Management Authority (AFAD)
- Municipalities
- Universities and Research Centers
- Civil Society Organizations (Red Crescent, AKUT, TEMA, Yeşilay, and local NGOs)

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ADAPTATION ACTIONS FOR SUSTAINABLE BIODIVERSITY

- Enhance habitat connectivity and ecological corridors
- Protect and restore native ecosystems
- Implement climate-resilient protected areas
- Promote sustainable land use and agroecological practices
- Strengthen invasive species management
- Enhance research and monitoring of species and ecosystems
- Develop a Regional Biodiversity Conservation Strategy
- Establish ecological corridors linking fragmented habitats
- Upgrade and expand protected area networks
- Provide capacity building and incentives for sustainable land management
- Implement advanced monitoring systems for invasive species
- Foster collaboration between research institutions and conservation agencies

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INSTITUTIONS FOR COOPERATION

Regional Level

- Marmara Municipalities Union (MMU)
- Regional Development Agencies
- TÜBİTAK Marmara Research Center
- Universities and Academic Institutions
- NGOs and Civil Society Organizations

Local Level

- Metropolitan and District Municipalities
- Provincial Governorates
- Community Organizations and Mukhtars
- Private Sector and Public-Private Partnerships (PPPs)

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METHODOLOGIES AND TOOLS

- Climate Risk and Vulnerability Assessments (RVA)
- Participatory planning and stakeholder engagement
- Scenario planning and GIS mapping
- Annual monitoring, reporting, and evaluation

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CONCLUSION: A RESILIENT MARMARA

- With coordinated, long-term action,
- Marmara can adapt to climate change,
- Achieve national goals, and protect future generations.

THANK YOU
FOR YOUR ATTENTION

“Together, we can contribute to a sustainable future”

Questions & Discussion

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