وزارة البيئـــــــة والتغيّـــــــر المناخـــــــي
Ministry of Environment and Climate Change
State of Qatar • دولـــة قطـــر



الخطة الوطنية للتكيف
National Adaptation Plan

National Adaptation Plan (NAP) of the State of Qatar

Technical Summary

1. Introduction: Qatar's Journey Towards Climate Resilience



Qatar faces mounting risks from climate change, including extreme heat, water scarcity, sea-level rise, and threats to public health, ecosystems, and infrastructure. Recognizing these risks, Qatar developed its National Adaptation Plan (NAP) within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. NAP provides a structured pathway to strengthen climate resilience, protect key sectors, and ensure sustainable development.

The NAP reflects a whole-of-society approach, integrating scientific assessments, stakeholder participation, and alignment with major national frameworks, including the Qatar National Vision 2030 (QNV), the Third National Development Strategy (NDS-3), the National Climate Change Action Plan (NCCAP), and the Qatar National Environment and Climate Change Strategy (QNE). Key elements of the NAP methodology include:

- Climate Vulnerability and Impact Assessments (CVIA): Comprehensive assessments are conducted to identify at-risk sectors, communities, and ecosystems, with active involvement from government entities, research institutions, civil society, and local communities.

- Targeted Adaptation Measures Based on CVIA: Adaptation measures are prioritized per sector, focusing on critical areas such as water, energy and industry, infrastructure and coastal resilience, agriculture and livestock, biodiversity, and public health, based on the results of detailed risk assessments and stakeholder engagements.

- Monitoring and Evaluation (M&E) Framework and Review Mechanisms: Framework and review mechanisms will be established to monitor and evaluate the implementation of adaptation actions, ensuring adaptive management based on evolving risks.

In pursuing climate resilience, the NAP serves as a strategic guide to navigating the uncertainties posed by climate-related risks and challenges. Built on principles of continuous improvement, national ownership, integrated planning, stakeholder participation, and knowledge-based decision-making, the NAP lays the foundation for a resilient future. While challenges may arise, Qatar's commitment and collaborative efforts position the nation to emerge stronger, more resilient, and better prepared for the climate challenges of the future.

2. Objectives and Guiding Principles

Qatar's adaptation strategy is based on key guiding principles that serve as the foundation for developing the NAP and designing the adaptation measures outlined in this document. These principles guide the NAP process and shape the implementation of adaptation actions to effectively address the challenges posed by climate change.

Continuous Process:
Ensuring a continuous and iterative approach to adaptation planning. A commitment to a continuous process ensures that adaptation planning remains dynamic and iterative, allowing for adjustments and improvements over time in response to changing climate conditions and evolving knowledge.

Country Ownership:
Emphasizing country-owned and country-driven action in adaptation efforts. This reflects Qatar's commitment to leading and driving its adaptation efforts, with a focus on initiatives that are tailored to the nation's unique circumstances and priorities.

Integrated Approach:
Ensuring that adaptation planning is integrated across sectors and levels of government to promote coordinated and coherent actions. This will support Qatar in developing coherent policies and regulations that are supportive of its adaptation goals.

Social Inclusivity:
Implementing social inclusive approaches to adaptation planning. This is prioritized, ensuring that adaptation planning processes are participatory and inclusive, involving diverse stakeholders and communities to foster a sense of ownership and collective responsibility.

Scientific Knowledge Integration:
Qatar prioritizes integrating the best available scientific knowledge into its adaptation strategies, recognizing the importance of using evidence-based approaches to enhance resilience and sustainability.

3. International Alignment

Qatar's National Adaptation Plan (NAP) is firmly anchored in international climate frameworks and processes. It directly supports the objectives of the Paris Agreement by contributing to global efforts to limit temperature rise while enhancing adaptive capacity and reducing climate vulnerability. The NAP also reflects the priorities of the Sendai Framework for Disaster Risk Reduction through its emphasis on early warning systems, proactive risk reduction, and strengthening community preparedness. In line with the UNFCCC guidelines, the plan is designed to be country-driven, science-based, participatory, and iterative, ensuring that adaptation actions remain responsive to evolving climate risks and national priorities.

4. Climate Scenarios for Qatar

The foundational studies, such as the Qatar Climate Profile and Climate Vulnerability and Impact Assessments, have played a crucial role in assessing the country's vulnerability to climate change. These assessments provide the analytical basis for the potential impacts of climate change featured throughout the NAP document, including the sectoral analysis.

The models used in this report are drawn from the Coupled Model Intercomparison Project (CMIP) Phases 5 and 6, which are coordinated by the World Climate Research Program and widely used by the IPCC in its climate assessments. These models use interactions between the atmosphere, ocean, and land to estimate future climate conditions under varying greenhouse gas (GHG) emission scenarios.

To assess potential climate futures, the IPCC employs two key scenarios: Shared Socioeconomic Pathways (SSPs) and Representative Concentration Pathways (RCPs). SSPs consider both emissions levels and socioeconomic factors, while RCPs focus solely on emissions trajectories. This report applies two scenarios: SSP2-4.5 / RCP4.5 and SSP5-8.5 / RCP8.5 to provide insight into Qatar's possible climate future based on different policy and emissions pathways. SSP5-8.5 / RCP8.5 is used as a reference scenario to assess potential climate impacts in the absence of additional mitigation measures. See Table 1.

Table 1. The scenarios and their differences

Scenario	Name of Corresponding SSP	Name of Corresponding RCP	Socio-economic conditions (according to SSPs only)	Global Warming by 2100
"SSP2-4.5 / RCP4.5"	SSP2-4.5	RCP4.5	• Emissions will continue to increase. • Moderate global efforts to mitigate emissions and adapt. • Population growth will peak between 2070-2080 at 9.5 billion.	3.5 to 4.2 deg C
"SSP5-8.5 / RCP8.5"	SSP5-8.5	RCP8.5	• Global intensification of fossil fuels. • Minimal global efforts to mitigate emissions and adapt. • Population growth will peak between 2050-2060 at 8.5 billion.	4.7 to 5.1 deg C

Using the above climate models simulations under two scenario pathways, the assessments project possible future climate outcomes for Qatar based on different policy and emission trajectories. These assessments examine how sectors are affected by climate hazards (sensitivity) and their ability to adapt (adaptive capacity). The findings highlight climate hazards to Qatar's environment, infrastructure, and public health as below.

Key Climate Hazards in Qatar

Qatar's geographic and climatic characteristics make it particularly vulnerable to the impacts of climate change. Its arid environment, flat topography, and extensive coastline increase its exposure to extreme heat, rising sea levels, and variability in precipitation. Key climate hazards in Qatar include rising mean air temperature, changing precipitation patterns, extreme events, and wind-related, coastal, and marine hazards.

5. Vulnerability and Impacts Across Key Sectors

Qatar has identified six key sectors as particularly vulnerable to climate change: water, energy and industry, infrastructure and coastal resilience, agriculture and livestock, biodiversity, and public health. The impacts of climate change on these sectors may affect the country's economy, environment, and social well-being. In response, Qatar is implementing targeted adaptation initiatives to strengthen resilience and mitigate potential risks. While the analysis focuses on these sectors, the section also highlights cross-sectoral mechanisms, such as early warning systems, that support climate risk management and resilience across multiple sectors. This section summarises the climate change impacts on these sectors and the current adaptation efforts underway to safeguard Qatar's future.

Agriculture and Livestock Sector

The agriculture and livestock sector depends on stable climatic conditions for its crops, livestock, and workforce, making it vulnerable to increasing temperatures, shifting precipitation patterns, and sea-level rise. While Qatar has made commendable strides in adopting climate-smart agriculture practices, the sector remains vulnerable to water scarcity and rising temperatures. Similarly, the fishing industry is vulnerable to changing sea temperatures while fluctuation in nutrient levels impact fish stock, causing them to migrate in more favourable regions and environments.

The potential impacts of climate change on Qatar's agriculture and livestock sector are outlined in the table below.

Table 2. Impacts on the agriculture and livestock sector

Direct Impact	Description of Direct Impact	Type of Impact
Decreased crop yield.	Decrease in crop yield due to worsening climate and environmental conditions, which may affect the cost of production and profitability of the sector.	Economic
Reduction in strength of natural capital.	Reduction in natural capital, through decreased soil and water quality, leading to a reduction in the resilience of crops and livestock.	Economic
Change to characteristics of coastal ecosystems.	Change in characteristics of coastal ecosystems, including the number and health of fish species, and the size and health of corals.	Environmental

Direct Impact	Description of Direct Impact	Type of Impact
Increase in consumption of fossil fuels to address cooling needs.	Increased greenhouse gas emissions from fossil fuels used for space cooling for livestock farming.	Environmental

Biodiversity Sector

Qatar's biodiversity includes a wide range of marine and terrestrial species that have adapted to the harsh and variable conditions of the Arabian Peninsula. Its ecosystems support diverse flora and fauna, and new species continue to be discovered. Along Qatar's coast, marine life thrives in environments, such as coral reefs, salt marshes, mangroves, and seagrass beds. The country is home to a diverse range of species, including important discoveries, such as branchiopods and mysid shrimp. Marine species, such as the endangered hawksbill turtle and the vulnerable dugong, are also part of the marine ecosystem. For terrestrial species, Qatar is rich in terrestrial animals and plant species, many of which are rare.
Both terrestrial and marine biodiversity in Qatar faces growing exposure to extreme heat and other climate related risks. Coastal ecosystems are particularly vulnerable to shifts in sea temperatures, rising sea levels, intense storm events, and ocean acidification, potentially affecting various animal species. Similarly, terrestrial biodiversity faces threats from sea-level rise, droughts, and humidity changes, impacting habitats and migratory patterns.

The potential impacts of climate change on Qatar's biodiversity sector are outlined in the table below.

Table 3. Impacts on the biodiversity sector

Direct Impact	Description of Direct Impact	Type of Impact
Damage to commercially important habitats and species.	Hazards, such as storms, may damage commercially important habitats, including mangroves and seagrass, and threaten commercially important species, such as shrimp and crustaceans.	Economic
Contamination of natural habitats of local flora and fauna.	Flooding of waste and wastewater facilities can contaminate water sources and soil, harm natural habitats and expose local plants and animals to pollutants.	Environmental
Increase in desalination costs.	Increased jellyfish blooms could impose maintenance costs on desalination plants.	Economic

Direct Impact	Description of Direct Impact	Type of Impact
Decrease in food security.	Reduction in food security due to potential impacts on fishery stocks.	Social
Increase in species' mortality and extinction rates.	Mortality and extinction rates could increase for terrestrial and marine species if already sensitive habitats are altered or degraded.	Environmental
Reduction in sea and land quality.	The overall sea and land quality may be reduced due to biodiversity loss and ecosystem degradation.	Environmental

Energy and Industry Sector

The energy sector in Qatar is sensitive to extreme heat, humidity, sea-level rise, storms, and flooding. These climate hazards may affect both energy supply and demand. To strengthen the resilience of the energy and industry sector, Qatar invests in research related to climate-resilient technologies. There are also plans to diversify energy sources by expanding renewable energy, through solar power plants, such as those in Mesaieed and Ras Laffan industrial cities.

The potential impacts of climate change on Qatar's energy and industry sector are outlined in the table below.

Table 4. Impacts on the energy and industry sector

Direct Impact	Description of Direct Impact	Type of Impact
Increased expenditure on maintenance and repair of energy and industry infrastructure.	Extreme heat, humidity and sea-level rise may damage energy infrastructure and industry facilities, increasing maintenance costs, repairs, and generate operational disruptions.	Economic
Increase in costs associated with cooling energy generation.	Higher temperatures increase cooling demands in energy generation, leading to higher operational costs and potentially higher energy prices.	Economic
Higher cooling demand and population growth drive up emissions.	Rising temperatures, extreme events, and population growth boost energy and water demand and associated emissions.	Environmental
Power outages and health risks from extreme heat.	Extreme heat can cause power outages and health risks, reducing productivity in energy and industry sectors.	Social



Water Sector

Qatar's water sector is sensitive to climatic changes due to the intrinsic link between water supplies and the climate. The combination of arid climate, high evaporation rates, low annual rainfall, and groundwater dependence increases the sensitivity of Qatar's water sector. Enhancing groundwater recharge and strengthening sustainable water management is important to ensure this vital resource remains a reliable buffer against the impacts of climate change. Groundwater recharge depends on stable temperatures, rainfall, and humidity levels, and is therefore sensitive to extreme heat and drought events. Desalination, a vital water source, is sensitive to ocean temperature and salinity levels, affecting both water quality and process efficiency. The sector's water storage facilities, and especially underground storage, are also sensitive to sea-level rise and coastal flooding.

In Qatar, both water supply and demand are highly exposed to increase in mean temperature and occurrences of extreme heat. Water sources and water network infrastructure, including piping and groundwater aquifers, are exposed to rising temperatures. Located along Qatar's coast, desalination plants are exposed to sea-level rise, storms, and coastal inundation. On the demand side, with most consumers located in cities, the urban heat island effect exacerbates hot extremes, leaving consumers highly exposed to temperature variability.

The potential impacts of climate change on Qatar's water sector are outlined in the table below.

Table 5. Impacts on the water sector

Direct Impact	Description of Direct Impact	Type of Impact
Increase in operational costs of desalination.	Rising ocean temperatures, acidity, and salinity could increase desalination costs by requiring additional treatment to make the water suitable for use.	Economic
Increase in government spending to sustain provision of desalinated water.	Rising desalination costs may lead to higher government spending, thereby reducing resources available for other sectors.	Economic
Increase in demand for drinking water.	Higher temperatures increase the need for drinking water, while droughts and changes in sea conditions reduce water availability. Reduced rainfall and rising evaporation rates also decrease groundwater recharge, further limiting freshwater supplies.	Social

Direct Impact	Description of Direct Impact	Type of Impact
Increase in greenhouse gas emissions due to intensifying desalination.	Increased desalination needs may raise energy consumption, leading to higher emissions. Simultaneously, declining groundwater recharge due to higher temperatures and reduced precipitation increases reliance on desalination.	Economic

Infrastructure and Coastal Resilience Sector

A large proportion of Qatar's critical infrastructure and urban development is concentrated in low-lying coastal areas, increasing vulnerability to sea-level rise. Qatar's flat terrain places much of its infrastructure just a few meters above sea-level, making it highly susceptible to coastal inundation. At-risk infrastructure includes transportation networks, residential and commercial developments, healthcare and education facilities, energy and utility systems, telecommunications, cultural institutions, public administration buildings, and sports venues. In addition to sea-level rise, infrastructure is exposed to extreme heat, which accelerates material degradation, particularly in urban areas affected by the heat island effect.

The potential impacts of climate change on Qatar's infrastructure and coastal resilience sector are outlined in the table below.

Table 6. Impacts on the infrastructure and coastal resilience sector

Direct Impact	Description of Direct Impact	Type of Impact
Increased expenditure on maintenance and repair of infrastructure.	Increased expenditure on maintenance and repair due to increased deterioration of infrastructure and potential damage from extreme events, such as storms and flooding.	Economic
Disruption to economic activity.	Increased expenditure on maintenance and repair due to increased deterioration of infrastructure and potential damage from extreme events, such as storms and flooding.	Economic



Direct Impact	Description of Direct Impact	Type of Impact
Damage to coastal infrastructure.	Rising sea levels and storm surges weaken foundations and damage coastal infrastructure leading to higher maintenance costs, service disruptions, and economic losses.	Economic
Impact on food security due to disrupted supply chains.	Qatar is highly reliant on imported products, including consumables. Disruption to the supply chain through damage to infrastructure may decrease food security.	Social

Public Health Sector

The public health sector exhibits vulnerabilities due to the relationship between health service demand, supply, and climate hazards. On the demand side, the public health sector is vulnerable to temperature-related risks such as extreme heat events and high humidity. This exposure is further amplified by the urban heat island effect in Doha, where most of the population is situated. These risks are closely linked to health issues, such as heat stress, exhaustion, and other illnesses. Consequently, healthcare demand may escalate, potentially increasing the vulnerability of service delivery.

On the supply side, rising sea levels and flooding may compromise access to public health services by damaging transport infrastructure or making it inaccessible. Moreover, medical facilities are concentrated in Doha, which is situated in low-lying areas and therefore exposed to risks of sea-level rise and associated coastal flooding, which places additional strain on the public health sector.

The potential impacts of climate change on Qatar's public health sector are outlined in the table below.

Table 7. Impacts on the public health sector

Direct Impact	Description of Direct Impact	Type of Impact
Increase in heat-related illness and respiratory disease.	Increase in the number of cases of heat stress and exhaustion admitted to hospitals. Potential increase in vector- or water-borne diseases due to flooding and insufficient drainage. Increase in respiratory health conditions due to sandstorms.	Economic and Social
Increased operational cost.	Increase in operational cost of healthcare services; increase in staff cost, replacement of equipment, etc.	Economic



Direct Impact	Description of Direct Impact	Type of Impact
Increase in greenhouse gas emissions.	Increase in emissions of greenhouse gases due to increase in energy use to accommodate increases in demand.	Environmental
Increase in waste generation.	Increases in waste, including toxic and hazardous waste, as well as household medical waste.	Environmental

Early Warning Systems (EWS) and Linkages to Loss and Damage

Early Warning Systems (EWS) are pivotal for building resilience across sectors – public safety, environmental protection, and health. Within the NAP framework, EWS serves as a frontline adaptation measure by enhancing preparedness, enabling rapid response, and reducing risks from diverse hazards such as extreme weather, industrial accidents, and health-related emergencies.

EWS also play a crucial role in the loss and damage agenda by providing the information and tools needed to minimize climate-related impacts that cannot be fully avoided. Strengthened EWS reduces the human, economic, and environmental costs of disasters by preventing escalation into irreversible loss, while supporting risk transfer mechanisms and recovery planning when damage does occur.

Integrating EWS into the NAP ensures that adaptation measures are not only forward-looking but also directly address the growing challenge of loss and damage in line with global frameworks under the UNFCCC, the Sendai Framework for Disaster Risk Reduction, and the Santiago Network.



6. Sectoral Adaptation Measures and Actions

Based on comprehensive Climate Vulnerability and Impact Assessments (CVIA), six critical sectors have been identified as the focus of Qatar's adaptation planning, together with several cross-cutting themes. For each sector, stakeholder-prioritized adaptation measures have been developed, supported by a portfolio of concrete actions (and corresponding projects) to be implemented in the coming years.

The NAP outlines a total of 28 adaptation measures, encompassing 127 adaptation actions and more than 280 adaptation projects across the six priority sectors and six cross-sectoral thematic areas. The following overview highlights the six priority sectors and cross-cutting themes, presenting their stakeholder-prioritized measures and associated actions (i.e. projects and initiatives) that will drive climate adaptation in each sector.

6.1 Water Management (13 actions)

Qatar is among the most water-scarce countries in the world, relying almost entirely on desalination for its freshwater supply. To address this challenge, adaptation in the water sector focuses on improving efficiency, expanding reuse, safeguarding natural resources, and ensuring resilience of supply systems under climate stress. The adaptation measures include:

National Strategy for Water Use, Reuse Efficiency, and Monitoring (5 actions):
Improves water security by regulating usage, expanding greywater and treated sewage reuse in Heating, Ventilation, and Air Conditioning (HVAC) and agriculture, reducing non-revenue water losses, and enabling real-time monitoring through a national water database.

Development and Modernization of Water Infrastructure (2 actions):
Strengthens system reliability through green infrastructure, smart reservoir systems, aquifer storage projects, and upgraded wastewater facilities that increase recycling and resilience during peak demand or drought conditions.

Water Resource Management and Ecosystem Restoration Measures (3 actions):
Restores natural systems by reactivating wadis2, assessing groundwater resources, and designing wetlands to improve water retention, biodiversity, and flood control under climate stress.

Enhancing Awareness and Outreach including National-Scale Studies (3 actions):
Builds public and institutional adaptive capacity through conservation campaigns, water footprint education, and comprehensive studies on sustainability and desalination impacts to inform national policy.



6.2 Agriculture and Livestock (17 actions)

Agriculture and livestock in Qatar face significant challenges due to water scarcity, rising temperatures, and land degradation. The sector is critical for food security, rural livelihoods, and diversification, and adaptation measures focus on building climate-smart systems that conserve resources while sustaining productivity. The adaptation measures include:



Climate-Resilient and Smart Farming Practices (7 actions):
Promotes drought-tolerant crops, regenerative agriculture, and climate-controlled greenhouses, including smart irrigation systems, seed banks, and algal tanks to boost food security, restore soil health, and adapt to rising temperatures and water stress.



Climate-Informed Advisory and Risk Management Services (4 actions):
Strengthens early warning systems, institutional coordination, and agricultural R&D, including irrigation efficiency studies and disease outbreak prevention, to help farmers manage climate risks and maintain productivity under extreme weather events.



Climate-Smart Livestock and Aquaculture (6 actions):
Enhances livestock and fishery resilience by introducing passive cooling systems, expanding local feed production, and developing coastal fish farms using Recirculating Aquaculture Systems (RAS) to adapt to heat stress, prevent overfishing, and minimize supply disruptions.

6.3 Infrastructure and Coastal Resilience (15 Actions)

Qatar's infrastructure is highly exposed to sea level rise, storm surges, flooding, and extreme heat. With critical assets concentrated along the coastline, adaptation in this sector focuses on protecting infrastructure, safeguarding communities, and ensuring climate-resilient urban development. The adaptation measures include:



Urban Planning, Green Infrastructure, and Drainage Management (9 actions):
Improves resilience to floods and heat by integrating stormwater systems, green-certified buildings, shaded walkways, underground utilities and tree planting.



Coastal and Flood Resilience (3 actions):
Protects vulnerable coastlines and infrastructure through sea wall upgrades, storm surge modelling, shoreline monitoring, and flood prevention plans using nature-based drainage solutions, such as environmental focal areas.



Sustainable Transport and Mobility (3 actions):
Supports climate-resilient mobility by piloting autonomous vehicles, transitioning taxi fleets to low-emission vehicles, and studying climate risks to transport infrastructure, such as metro networks.

6.4 Energy and Industry (19 actions)

Qatar's energy and industrial systems are central to its economy but face increasing climate risks from extreme heat, resource stress, and global decarbonization trends. Adaptation measures in this sector focus on reducing vulnerability, enhancing efficiency, and supporting economic diversification while aligning with Qatar's long-term low-carbon vision. The adaptation measures include

Mitigation and Energy Efficiency Measures with Adaptation Benefits (6 actions):
Enhances energy system resilience by adopting solar power, electric vehicles, green appliances, energy-efficient HVAC systems, and solar water heaters.

Energy Infrastructure to Support and Improve Existing Adaptation Measures (3 actions):
Strengthens foundational infrastructure through greenfield projects and retrofits to ensure energy reliability and support broader climate adaptation efforts.

Economic Diversification (5 actions):
Reduces climate and market vulnerability by expanding sustainable economic zones, investing in clean tech Research and Development (R&D), building a future-ready workforce, and supporting circular industries.

Adaptation Measures with Mitigation Co-Benefits (5 actions):
Improves climate resilience while cutting emissions through smart energy actions, such as installing peaking power units, weather-responsive cooling systems, and smart meters, to optimize utility use and reduce stress on infrastructure.



6.5 Biodiversity Conservation (16 actions)

Qatar's terrestrial, coastal, and marine ecosystems are increasingly threatened by climate change, land degradation, and biodiversity loss. Adaptation in this sector focuses on strengthening ecological resilience through habitat conservation, species protection, research, and policy measures that safeguard Qatar's natural capital and ensure ecosystem services for future generations. The adaptation measures include:

Regulatory, Policy Instruments, and Educational Campaigns for Biodiversity Protection (4 actions):
Strengthens Qatar's resilience to biodiversity loss by enacting net-positive biodiversity legislation, considering offset programs and building public awareness through education and stakeholder capacity-building initiatives.

Protected Areas, Natural Habitat Conservation, and Ecological Connectivity (4 actions):
Enhances ecosystem resilience to climate change by expanding protected areas, creating wildlife corridors, restoring wetlands, such as Al Thakira, and safeguarding terrestrial, coastal, and aquifer habitats.

Species and Genetic Conservation (In Situ and Ex Situ) (4 actions):
Safeguards biodiversity under climate stress through genomics research on Qatari flora, in vitro propagation of endangered plants, and species conservation plans that protect genetic diversity and control invasive species.

Monitoring, Research, and Early Warning Systems for Biodiversity Conservation (4 actions):
Improves adaptive management by tracking ecosystem changes through biodiversity assessments of temporary desert meadows (known as "Rawdat"), digitized herbarium records, AI-based threat detection, and expanded research and early warning systems.



6.6 Public Health (15 actions)

Qatar's public health sector is increasingly exposed to climate-related risks such as extreme heat, air pollution, and the spread of climate-sensitive diseases. Adaptation measures aim to safeguard community well-being by building climate-resilient healthcare systems, protecting vulnerable groups from heat stress, and strengthening disease surveillance and research capacities. The adaptation measures include:

Regulatory, Policy Instruments, and Educational Campaigns for Biodiversity Protection (4 actions):
Strengthens Qatar's resilience to biodiversity loss by enacting net-positive biodiversity legislation, considering offset programs and building public awareness through education and stakeholder capacity-building initiatives.

Heat Stress Protection and Emergency Preparedness (2 actions):
Protects communities and workers from rising temperatures through early warning systems, heat action regulations, such as Decree 17/2021, and coordinated emergency responses that reduce heat-related health risks.

Monitoring, Surveillance, and Climate-Health Research (4 actions):
Builds adaptive capacity by expanding air quality and indoor air monitoring, enhancing disease surveillance (e.g., vector-borne diseases), and conducting climate-health research on respiratory illnesses to guide evidence-based public health planning.

Climate-Health Programs, Health Education and Training (4 actions):
Enhances the knowledge of professionals in climate actions through training, workshops, knowledge exchange, etc.





6.7 Cross-Sectoral Adaptation Measures and Actions (32 actions)

In addition to sector-specific initiatives, the NAP identifies a set of cross-sectoral measures that enhance resilience across multiple systems. These actions integrate water, energy, health, ecosystems, finance, and data management, ensuring that adaptation is holistic and interconnected. The adaptation measures include:

Integrated Water-Energy Nexus Adaptation Measures (4 actions)

Improves resource efficiency and resilience by using reverse osmosis desalination, treated sewage effluent for energy cooling, and passive cooling systems that reduce the interlinked vulnerabilities of water and energy sectors.

Environmental Health and Ecosystem-Linked Adaptation (4 actions)

Protects public health and ecosystems through safe pesticide use, pest surveillance, expanded foul sewer networks, and low-emission odour control systems to address pollution and biodiversity risks together.

Early Warning Systems and Disaster Risk Management (7 actions)

Reduces disaster risk and enhances preparedness by integrating flood forecasts, climate-health alerts, asset protection plans, and climate-aware business continuity and emergency response systems.

Circular Economy, Water Recycling and Circular Resource Use, Waste Management, and Resource Efficiency (8 actions)

Advances sustainable resource use through sludge reuse in cement, recycled construction materials, ESG platforms, and sustainable procurement policies that reduce waste and support climate-resilient markets.

Climate Data, Monitoring, and Artificial Intelligence (AI) Integration (6 actions)

Enhances climate decision-making by embedding AI into infrastructure monitoring, flood modelling, air quality systems, and risk management tools across transport and building sectors.

Green Finance for Adaptation and ESG Goals (3 actions)

Mobilizes climate finance through Qatar's Sovereign Green Financing Framework, sustainable finance data platforms, and ESG-aligned investment criteria that drive funding toward climate-resilient development.

7. Strategic Enablers for Effective Adaptation

As Qatar faces the multifaceted challenges posed by climate change, a cross-sectoral approach to adaptation becomes essential. This section summarises the interconnected nature of various sectors and the importance of developing integrated strategies that address these interdependencies. By recognizing that climate impacts extend beyond individual sectors, Qatar aims to foster resilience through coordinated efforts that span energy and industry, agriculture and livestock, water resources, infrastructure and coastal resilience, biodiversity conservation and public health.

The holistic strategies outlined in this section emphasize the need for collaborative planning and action, leveraging synergies across sectors to maximize the effectiveness of adaptation measures. By adopting an integrated approach, Qatar seeks to ensure that adaptation efforts are not only efficient and cost-effective but also capable of addressing the complex and dynamic nature of climate risks. Through comprehensive planning, stakeholder engagement, and innovative solutions, Qatar is committed to building a resilient future that safeguards its environment, economy, and society against the impacts of climate change.

Enhancing Regulatory Landscapes

The State of Qatar is strengthening its climate adaptation agenda by enhancing its regulatory and institutional frameworks across key sectors to promote coherence, resilience, and long-term sustainability. Recent efforts include updates to food security strategies that support sustainable production, efficient resource use, improved storage systems, and diversified trade. In parallel, biodiversity protection is being advanced through revised fishing requirements for development projects to adopt net-positive design measures. Infrastructure resilience is also being prioritized through the integration of sustainable drainage, coastal protection, and climate-responsive design standards.

Qatar also implements green construction practices, enforcing conservation measures, and monitoring key environmental indicators. In the water sector, Qatar regulates water consumption and groundwater use in coordination with relevant authorities, and advances efficiency through the Tarsheed program, while also tracking key indicators including water use, groundwater extraction, and water quality.



Building Capacity and Skills for Resilience

In response to increasing climate variability and environmental challenges, Qatar underscores the strategic importance of capacity building as a cornerstone for enhancing national resilience. Recognizing that effective adaptation requires informed, empowered, and coordinated action, the country is advancing a range of initiatives aligned with the NAP. These initiatives aim to strengthen technical knowledge, practical skills, and institutional coordination across sectors and governance levels, enabling diverse stakeholders to actively contribute to adaptation and sustainable development.

Qatar is advancing broad-based environmental awareness and sustainability through collaborative efforts across public institutions, civil society, and community-focused organizations. Greener construction practices are promoted through industry engagement, recognition programs, and capacity building, while environmental learning is integrated into formal education and extracurricular activities, supported by initiatives that strengthen environmental literacy among students and families.
Community-based programs foster hands-on learning in regenerative agriculture for both children and adults, and youth initiatives cultivate environmental leadership through advocacy, citizen science, and climate-focused education. Complementing these efforts, nationwide water and energy conservation campaigns encourage more sustainable household behaviours, reinforcing a culture of environmental responsibility across the country.

Shaping the Future with Innovative Technologies

Qatar is strategically integrating innovative technologies to strengthen climate resilience and sustainability across key sectors. By deploying tools such as Artificial Intelligence (AI), the Internet of Things (IoT), blockchain, and advanced data analytics, the country is enhancing its capacity to anticipate climate risks, improve resource efficiency, and implement adaptive responses across environmental, social, and economic systems.

Qatar's Digital Agenda 2030 provides a national foundation for digital transformation, creating advanced infrastructure, stronger innovation systems, and a more digitally empowered society, all of which support climate adaptation and resilience across key sectors. Qatar hopes to integrate AI, IoT, data analytics, and smart systems to enhance climate-smart agriculture, improve the durability and safety of transport and infrastructure, strengthen energy efficiency through real-time operations and cooling innovations, and advance sustainable water management with smart grids, leak detection, and predictive tools. These digital solutions help optimize resources, improve early-warning capabilities, and enable more adaptive, resilient, and efficient operations across climate-sensitive sectors.

Building the Infrastructure for Data and Knowledge

A strong data and knowledge system is essential for effective climate adaptation in Qatar. This includes collecting and integrating reliable climate, environmental, social, and health data from national, international, and community sources. Ensuring data quality, consistency, and accessibility supports informed decision-making. To fully benefit from this data, Qatar must invest in tools like GIS, climate models, and AI, along with training and cross-sector collaboration. Sharing knowledge through digital platforms and communication efforts will raise awareness and engagement. Policies and institutions are needed to embed data use in national planning. Overcoming gaps and challenges requires innovation, funding, and global cooperation.

Building the Infrastructure for Data and Knowledge

A strong data and knowledge system is essential for effective climate adaptation in Qatar. This includes collecting and integrating reliable climate, environmental, social, and health data from national, international, and community sources. Ensuring data quality, consistency, and accessibility supports informed decision-making. To fully benefit from this data, Qatar must invest in tools like GIS, climate models, and AI, along with training and cross-sector collaboration. Sharing knowledge through digital platforms and communication efforts will raise awareness and engagement. Policies and institutions are needed to embed data use in national planning. Overcoming gaps and challenges requires innovation, funding, and global cooperation.

Qatar is steadily building a comprehensive knowledge and data ecosystem to support climate adaptation by advancing research, monitoring, and evidence-based planning across multiple sectors. National institutions are strengthening data systems for agriculture, infrastructure, water, transport, health, and environmental management—ranging from pest and disease surveys, material recycling studies, and flood-risk assessments to large-scale water balance research and integrated national water databases. Complementary initiatives, such as Tarsheed's public awareness campaigns and health sector education on heat and air pollution, further promote informed decision-making and resilient behaviours. Collectively, these efforts reflect Qatar's commitment to science-driven adaptation, improved resource management, and community engagement in line with national sustainability goals.

Enhancing Regulatory Landscapes
Update policies and strengthen institutional frameworks.

Building Capacity and Skills for Resilience
Develop skills, training and awareness.



Shaping the Future with Innovative Technologies
Use AI and digital tools to improve resilience.

Building the Infrastructure for Data and Knowledge
Collect and integrate reliable data to support decision-making.



8. Institutional Arrangements for NAP Coordination and Implementation

Qatar's NAP is a strategic initiative aimed at building resilience to climate change across key sectors. A robust governance framework is critical for ensuring its successful implementation. This proposed framework is designed to provide a coordinated, inclusive, and effective approach to addressing the challenges posed by climate change. By focusing on sector-specific strategies in areas such as water, energy and industry, infrastructure and coastal resilience, agriculture and livestock, biodiversity, and public health, Qatar aims to address climate change in a comprehensive and integrated manner.

The Ministry of Environment and Climate Change plays a pivotal role in providing strategic oversight, ensuring that the NAP aligns with national development goals, climate policies, and international commitments.

National public agencies and semi-governmental organizations are central to the development and implementation of sector-specific adaptation plans, prioritizing actions and ensuring cross-sectoral coordination. Non-governmental organizations and civil society contribute by promoting inclusivity, engaging local communities, raising awareness, and advocating for sustainable and equitable adaptation practices. Research institutions and academia support the framework by providing evidence-based policy development, fostering innovation, and evaluating the effectiveness of adaptation efforts. The private sector plays a key role through investments in climate-resilient infrastructure, technological innovation, and public-private partnerships.

The governance framework is supported by essential enablers that span across sectors, ensuring effective NAP implementation. Adaptation finance ensures the necessary funding is available for projects, leveraging both public and private resources. Stakeholder engagement promotes collaboration and inclusivity, ensuring all groups are involved in decision-making. Capacity building strengthens the ability of institutions and communities to plan and implement adaptation actions through training and knowledge development. Data and knowledge infrastructure provides the necessary tools for monitoring climate risks and assessing adaptation effectiveness. Finally, technological innovation drives the development of new solutions to enhance climate resilience and supports the integration of climate-smart technologies across sectors.



Key Components of the Proposed Governance Structure:



National Public Agencies and Semi-Governmental Organizations:
National public agencies and semi-governmental organizations are established for key sectors such as water, energy and industry, infrastructure and coastal resilience, agriculture and livestock, biodiversity, and public health. These organizations are tasked with developing sector-specific adaptation plans, identifying priority actions, and coordinating implementation efforts.



Non-Government and Civil Society Organizations:
These organizations play a vital role in NAP implementation by applying their expertise in climate science and sustainable practices. They engage with communities through awareness campaigns and capacity-building initiatives, strengthening local resilience and promoting inclusive adaptation strategies. Additionally, they advocate for climate adaptation policies and collaborate with government agencies, the private sector, and international partners to mobilize resources and expertise, ensuring a comprehensive approach to addressing climate risks.



Research and Academia Organizations:
Provide crucial research, knowledge, evidence, scientific expertise and foster innovation which is essential in identifying the climate impacts and adaptation strategies. They inform policy development with evidence-based recommendations, contribute to capacity building through education and training, and monitor the effectiveness of adaptation measures. These groups enhance Qatar's climate resilience through international collaboration, sharing best practices, and advancing sustainable development goals via inclusive community engagement and stakeholder participation.



Private Sector:
The private sector drives innovation investments in climate-resilient infrastructure and technologies and integrates adaptation measures into business strategies. Companies contribute to sustainable development by developing resilient practices, collaborating in public-private partnerships to finance and execute adaptation projects, and enhancing risk management through climate-conscious investments and insurance solutions.3 Through community engagement, corporate social responsibility initiatives and aligning to environmental, social and corporate governance (ESG) criteria, the private sector fosters awareness of climate risks and supports local resilience efforts, aligning business operations with national adaptation goals.

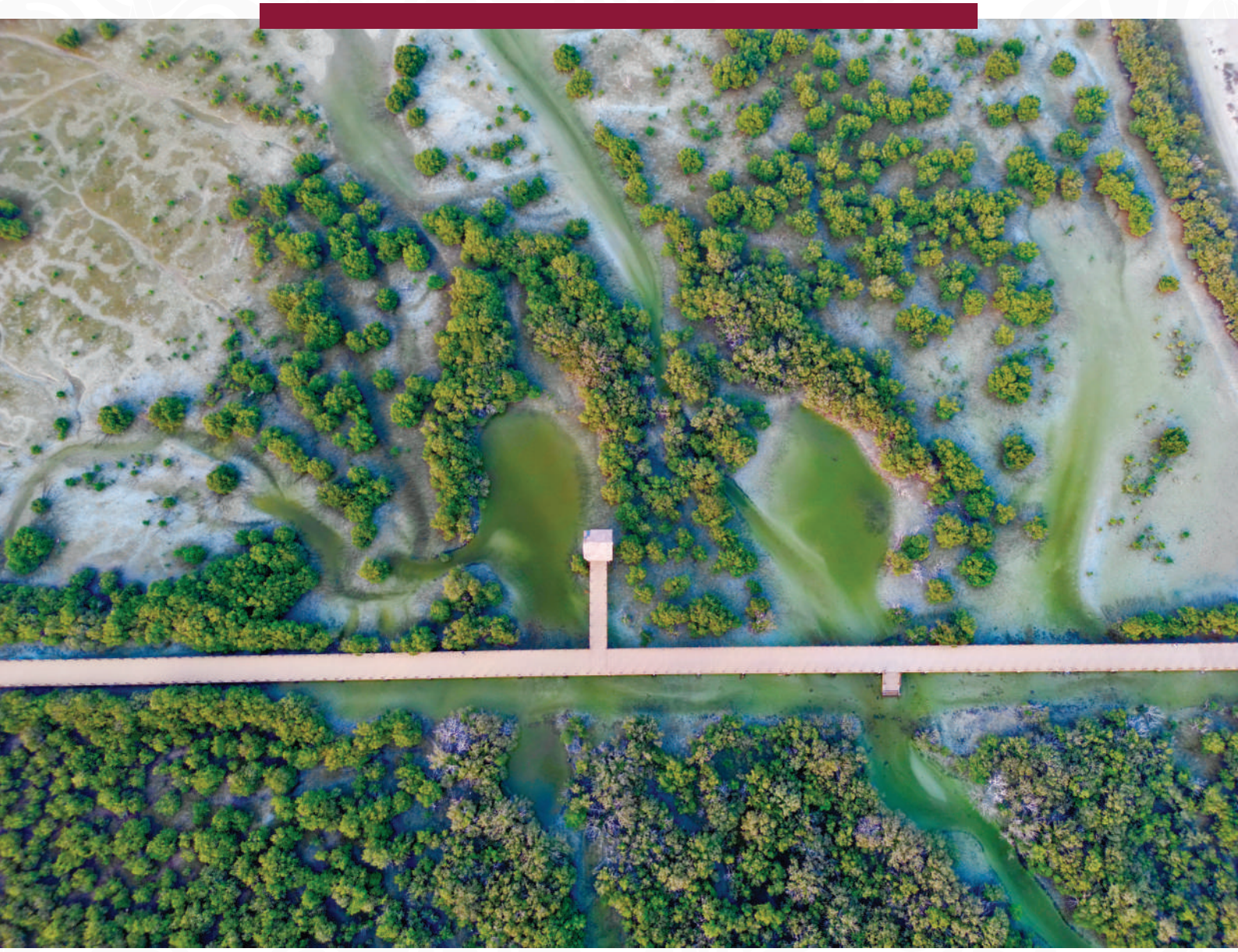
The integration of climate change adaptation plans into key sectors is supported by various cross-cutting enablers. These enablers include adaptation finance, governance and institutions, stakeholder engagements, skills and capacity building, data and knowledge infrastructure, and technology innovation.

9. Looking Ahead: Vision 2030 and Beyond

The NAP sets progressive horizons:

Vision 2030: A resilient Qatar where adaptation is mainstreamed into national development strategies, food and water security are strengthened, public health systems are climate-proofed, biodiversity is safeguarded, and private sector engagement in green investment is robust.

Qatar's NAP is both a strategic vision and an operational framework, positioning the nation to not only address its vulnerabilities but also to leverage adaptation as an opportunity for innovation, leadership, and sustainable growth. Beginning in 2026, the NAP will transition into its operational phase, marked by the implementation of pilot projects and the practical application of adaptation measures across sectors, ensuring that planned actions translate into tangible resilience on the ground.



Scan to visit our website

www.mecc.gov.qa

وزارة البيئة والتغيّر المناخي
Ministry of Environment and Climate Change
State of Qatar • دولة قطر

Qatar Ministry of Environment and Climate Change, Al Udeid Tower, West Bay, Doha, Qatar

الخطة الوطنية للتكيف
National Adaptation Plan