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Nationally determined contributions under the Paris Agreement

Synthesis report by the secretariat

Addendum

Additional information from adaptation components of nationally determined contributions

Summary

This addendum provides additional information synthesized from adaptation components of the 164 latest available nationally determined contributions communicated by the 191 Parties to the Paris Agreement and recorded in the interim registry of nationally determined contributions as at 30 July 2021.

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Further information from adaptation components of nationally determined contributions

1.   According to their nationally determined contributions (NDCs), Parties' adaptation efforts are focused in particular in the areas of food production and nutrition security, freshwater resources, terrestrial and wetland ecosystems, human health, key economic sectors and services, disaster risk management, urban areas and other human habitats, coastal and low-lying areas, and ocean ecosystems. Figure 1 provides an overview of the adaptation priority areas and sectors specified in the 151 NDCs that contain adaptation information.

2.   In their NDCs, Parties reported a wide range of specific measures (see table 1 for examples) and quantified targets (see table 2 for examples) in their adaptation priority areas and sectors.

3.   In their adaptation components, Parties described synergies between their adaptation efforts and efforts under other international frameworks, such as the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015–2030, the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, and the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat. While most of those Parties described such synergies in general terms, a number highlighted how specific efforts in adaptation priority areas are contributing to particular Sustainable Development Goals, as summarized in figure 2.

Figure 1
Share of adaptation components of nationally determined contributions referring to specific adaptation priority areas and sectors
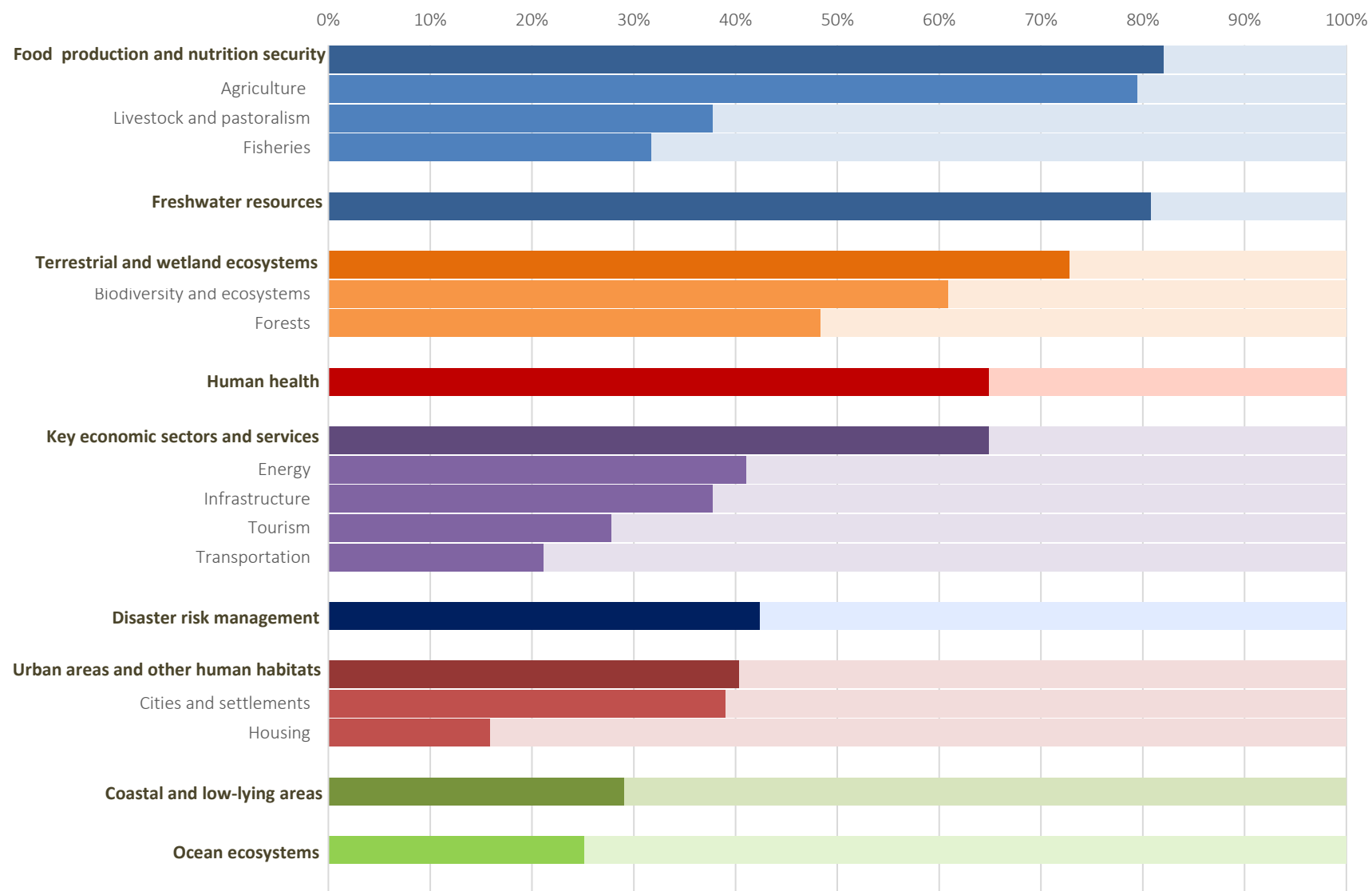
Table 1
Examples of measures in adaptation priority areas communicated in nationally determined contributions

Priority area	Adaptation measures
Food production and nutrition security	**Agriculture**
	- Diversifying agricultural activities, such as through fruit tree cultivation, urban farming and use of alternative proteins and import sources
	- Promoting responsible consumption and production
	- Integrating climate aspects into crop-specific mapping and planning, including by adapting agricultural calendars and sowing dates
	- Enhancing water resources, such as through vegetative rain and mist harvesting, solar-powered irrigation and agricultural infrastructure
	- Using mulching and zero-tillage techniques and environmentally friendly fertilizers
	- Increasing vertical and hydroponic farming, use of greenhouses and/or mechanization
	- Recuperating salinated lands
	- Integrating farming and livestock production, and promoting agroforestry and/or agricultural fish farming
	- Developing financial instruments, such as funds, microcredit and grants, and incorporating adaptation into investment projects
	- Strengthening agro-enterpreneurialism and agricultural production capacity, and empowering farmers, such as through appropriate pricing of agricultural products, access to markets, digital farming, and farmers associations and networks
	- Applying traditional knowledge and community-based approaches
	Livestock
	- Implementing breeding and genetic improvements
	- Rehabilitating watering points
	- Diversifying feed
	- Introducing silvopastoralist systems and integrated farming and livestock practices
	- Promoting climate-smart and sustainable resource management
	- Using climate information and monitoring to establish disaster prevention systems and guide decision-making
	- Providing indoor housing for livestock
	- Managing transhumance corridors
	- Developing conflict resolution mechanisms for land-use conflicts
	Fisheries
	- Carrying out research and development in relation to changing fish stocks and productivity of fisheries
	- Enhancing education and awareness
	- Diversifying livelihoods
	- Adopting aquaculture and sustainable fish farming techniques
	- Expanding marine protected areas and restoring habitats and mangroves
	- Implementing an artificial reef project to recover local fish stocks
	- Enhancing efficiency of fishing vessels
	- Improving infrastructure
	- Monitoring, control and surveillance, including digital tracing of activities
Terrestrial and wetland ecosystems	- Conducting research and vulnerability analysis
	- Enhancing forest monitoring and data management, and identifying indicator species
	- Generating affordable and freely accessible information on adaptation and risk management to guide timely decision-making in the forestry sector
	- Introducing national biodiversity strategies and programmes
	- Developing a forest restoration and reforestation programme supported by incentive payments

Priority area	Adaptation measures
	- Establishing new and improving management of existing conservation areas
	- Increasing forest cover
	- Promoting ecosystem-based adaptation and agroforestry
	- Developing new techniques for conserving and transforming agroforestry products
	- Promoting use of alternative sources of energy in order to reduce deforestation
	- Introducing integrated natural resource management
	- Establishing water points for wildlife in protected areas
	- Implementing in and ex situ conservation
	- Introducing drought-resistant species
	- Rehabilitating wetlands
	- Improving sustainable use of forest resources
	- Protecting indigenous ecosystems and preserving cultural values
	- Implementing fire prevention measures
	- Implementing low-impact logging strategies
	- Conducting an awareness campaign on the importance of forests for ecosystem resilience
	- Developing plans for managing invasive species
Freshwater resources	- Developing or improving national information systems, including hydrological maps, water resource models and networks of meteorological stations
	- Defining watershed indicators
	- Developing tools for evaluating impacts and socioeconomic costs
	- Introducing measures for monitoring water demand and buffering against unpredictability
	- Developing financing tools for the water sector
	- Investing in potable water supply for households
	- Diversifying water supply, including through rainwater harvesting and treatment, recycling and desalination
	- Creating incentives for low-carbon desalination and adaptation technologies for efficient water use
	- Constructing an innovative desalination plant fuelled by renewable energy
	- Developing solar-powered boreholes
	- Artificially increasing the recharge rate of groundwater aquifers
	- Increasing the coverage and quality of wastewater treatment and promoting wastewater use for gardening, sanitary purposes, construction, etc.
	- Upgrading wastewater treatment plants
	- Improving the construction of dikes, upstream storage dams and storm drains
	- Enhancing storage options, including water collection and storage systems in drought-prone areas
	- Establishing salinity barriers in rivers
	- Assessing seawater intrusion in major coastal aquifers
	- Developing drainage and stormwater systems in urban centres
	- Deploying nature-based solutions to improve water replenishment and storage
	- Assessing alternatives for financing river conservation activities
	- Optimizing water resource allocation
	- Promoting community-based water management
	- Restoring vegetation coverage

Priority area	Adaptation measures
Human health	- Conducting research on climate impacts, climate-sensitive diseases and the climate–health nexus
	- Monitoring the epidemiological situation
	- Monitoring vector-borne diseases, creating suppression strategies and raising awareness
	- Improving health management information systems to incorporate climate stress indicators, accounting for maternal and neonatal health risks
	- Improving the national database of climate-related diseases of vulnerable groups
	- Developing early disease diagnosis and treatment programmes for malaria, meningitis and leishmaniasis
	- Establishing national health committees and regulations
	- Controlling outbreaks and distributing vaccines
	- Ensuring midday breaks at work, introducing safety programmes, establishing thermal work limits, creating heat stress information systems and introducing national heatwave plans
	- Developing training programmes on climate risks for health workers
	- Building hospitals equipped for treating climate-related diseases
	- Establishing public health facilities in rural areas
	- Defining building codes and standards for resilient health infrastructure
	- Implementing programmes to protect communities at risk of water-borne diseases
	- Recruiting and training community health workers to provide emergency first aid
	- Promoting use of insecticide-treated mosquito nets
Key economic sectors and services	**Energy**
	- Strengthening investment in and financing for resilient energy systems
	- Deploying smart grids and meters
	- Integrating consideration of climate variables into sectoral measures
	- Reducing climate risk across supply chains
	- Applying ecosystem-based adaptation approaches at hydrocarbon facilities
	- Strengthening biomass and bioenergy production
	- Enhancing resilience of hydropower sources and installations through water storage, multipurpose reservoirs, pumped storage, catchment areas and dam safety guidelines
	- Implementing measures to adapt to changing water flows
	- Applying technologies for storing hydrogen and green ammonia
	- Developing risk reduction instruments for the power sector
	- Defining emergency action plans
	Infrastructure
	- Adapting and retrofitting buildings, including by enhancing heating, ventilation, cooling and lighting systems
	- Protecting dams, public utilities, airports, ports and metro systems
	- Preparing road safety plans and upgrading roads by increasing drainage capacity
	- Using climate services, databases, artificial intelligence and analytics for infrastructure development
	Tourism
	- Enhancing access to clean energy for tourism operations (e.g. for desalination)
	- Establishing adaptation partnerships with the private sector
	- Strengthening international cooperation
Coastal and low-lying areas	- Promoting evidence-based coastal planning and management
	- Mainstreaming climate risk in coastal development
	- Establishing standards (e.g. for minimum elevation for coastal construction, zoning and flood protection)

Priority area	Adaptation measures
	- Constructing sea walls, tidal gates and pumping stations and putting in place wave protection measures
	- Creating nature-based solutions, such as coastal forests
	- Taking regional measures to protect river deltas
	- Integrating coastal considerations into existing climate plans and integrating climate change into coastal development plans
	- Mapping and demarcating coastal hazard lines
	- Establishing systems for accurately forecasting sea level rise
	- Promoting agrisilvicultural practices and sustainable rice cultivation in coastal landscapes
	- Promoting livelihood diversification for coastal communities
Ocean ecosystems	- Conducting research and monitoring, including remote sensing and ecosystem health surveillance
	- Establishing an observatory of coasts and marine environments
	- Taking measures to prevent overfishing and promote non-destructive fishing techniques
	- Rehabilitating and cultivating reefs and introducing artificial reefs
	- Taking ecosystem-based adaptation approaches, such as mangrove restoration
	- Reducing pollution, including by phasing out use of plastics, enhancing water treatment and reducing solid waste disposal
	- Creating a comprehensive seagrass conservation programme
	- Increasing productivity through climate-smart fisheries and aquacultural interventions
	- Including fishery zones within marine and coastal protection corridors
	- Validating and enforcing by-laws on mangrove wood harvesting, fishing and sand mining to promote mangrove conservation
Urban areas and other human habitats	- Evaluating urban vulnerabilities, including by assessing soil security and risk of flooding and erosion
	- Enhancing governing capacity in urban areas
	- Promoting resilient land-use planning, including by integrating climate and adaptation criteria into policy design, management and territorial planning
	- Strengthening urban planning for green and climate-resilient buildings, threatened buildings, infrastructure and drainage
	- Discouraging settlements in impact-prone areas
	- Building elevated settlements
	- Fortifying roofs against hurricanes
	- Taking low-cost measures such as beach recovery and reforestation
	- Improving urban green spaces (ecological corridors, trees, gardens, roofs, walls)
	- Supporting dangerous cliffs with walls and trenches
	- Creating buffer zones around risk areas
	- Supporting local communities in mobilizing climate finance
	- Capitalizing on innovative sustainable urban systems
	- Reducing sociospatial inequalities due to climate change between cities and rural areas
	- Raising awareness of the importance of adaptation for urban areas
Livelihoods	- Protecting livelihoods through financial arrangements such as microfinance, cash transfers, savings and loans, and/or social support funds
	- Protecting employment opportunities through long-term workforce planning and assistance for people seeking employment
	- Protecting the most vulnerable groups through social safety nets
	- Preparing guidelines for climate-related mobility

Priority area	Adaptation measures
Disaster risk management and early warning	- Integrating risk management into development policies
	- Integrating adaptation into disaster reduction plans
	- Implementing a national disaster risk reduction policy
	- Strengthening monitoring and early warning of hydrometeorological risks
	- Establishing a national disaster management centre
	- Establishing information mechanisms and databases
	- Strengthening financial instruments - Taking community-based measures

Table 2
Examples of quantified targets in adaptation priority areas communicated in nationally determined contributions

Priority area	Quantified targets
Food production and nutrition security	- Increasing food security for the most vulnerable 10 per cent of the population
	- Stabilizing the rate of food insecurity at 15 per cent
	- Meeting 30 per cent of national nutritional needs with domestic produce
	- Reducing food waste by 50 per cent by 2030
	Agriculture
	- Maintaining 6 per cent annual growth in agricultural production
	- Increasing annual rice and vegetable production by 2–3 per cent
	- Increasing the area under irrigation by 350,000 ha
	- Increasing irrigation coverage from 300,000 to 1 million ha by 2030
	- Doubling irrigated food production by 2020 and tripling it by 2030 from 1.69 Mt
	- Increasing the area under irrigated watershed development from 2 million to 10 million ha in 2018–2030
	- Increasing the area under medium- and large-scale irrigation schemes from 490,000 to 1.2 million ha in 2018–2030
	- Having 36 gender-balanced irrigation water user associations by 2030
	- Reaching 930,000 jobs created through expansion of the irrigation network by 2030
	- Enhancing water management under 40 irrigation schemes by 2025
	- Increasing water-use efficiency in irrigation by 10 per cent and implementing high-efficiency irrigation on at least 45,000 ha irrigated land by 2025
	- Increasing the productivity of rain-fed cropland from 29 to 46 quintals[3]/ha in 2018–2030
	- Expanding farm rainwater harvesting to cover 75 per cent of a specific target area by 2025
	- Expanding the proportion of agricultural land under agroforestry by 5 per cent in 2018–2030
	- Restoring 150,000 ha land through agroforestry by 2050
	- Increasing wheat seed coverage from 413,000 to 673,000 ha land in 2018–2030
	- Promoting crop diversification towards input-efficient and climate-tolerant varieties in 50 per cent of a specific target area by 2030
	- Reducing crop disease by 30 per cent in 2022–2023
	- Empowering women to take up 40 per cent of employment in agriculture and blue economy by 2030
	- Increasing the proportion of farmers covered by drought and crop insurance by 30 per cent between 2022–2023 and 2030
	- Implementing all identified measures for enhancing the resilience of subsistence agriculture by 2030
	- Eradicating burning of reed by 2025
	Livestock
	- Increasing livestock productivity by 10 per cent
	- Increasing the proportion of climate-resilient dairy livestock from 3 to 17 per cent in 2018–2030
	- Reducing livestock disease by 30 per cent between 2022–2023 and 2030
	Fisheries
	- Increasing productivity of fisheries by 10 per cent through climate-smart technology
	- Ensuring that all plans for fisheries development consider climate risk
	- Providing insurance schemes for fisheries by 2030
	- Establishing, by 2022, barricades in 50 flood-impacted reservoirs to prevent fish from escaping
	- Developing five ecosystem-based fishery management plans by 2025–2030
	- Preparing lagoon profiles for 30 lagoons by 2026, declaring 10 lagoons as co-managed fishery areas by 2030 and minimizing aquatic pollution in 10 lagoons by 2030

Priority area	Quantified targets
Terrestrial and wetland ecosystems	**Forest coverage** - Increasing forest coverage of land area to 42 per cent/from 16 to 25–30 per cent in 2018–2030/to 20 per cent by 2025/by 2 per cent in 2013–2030 - Maintaining 27 per cent forest coverage of land area - Renaturing 20 per cent of the national surface area by 2030 - Allocating 30 per cent of land to agroforestry by 2025 - Allocating 2,000 ha land to nature-based enterprises - Planting 30 million trees by 2035/1 million trees by 2030 - Protecting 3.5 million ha forest/conserving 1.3 million ha forest by 2030 - Establishing 200 local forest development organizations for sustainable forest management - Increasing reforested/restored area from 2.6 million to 9 million ha in 2018–2030 - Reforesting 1,000,000 ha by 2024 - Increasing natural forest area under sustainable management from 2 million to 4 million ha in 2018–2030 - Increasing the area of forest protected from diseases, pests and fire to 17.2 million ha by 2030 **Natural areas** - Increasing the total area of nature reserves to at least 5 per cent of the national territory - Protecting at least 20 per cent of natural terrestrial ecosystems and integrating all types of ecosystem into the protected area network - Assessing the conservation status of 75 per cent of flora and fauna species and implementing actions for conserving 50 per cent of threatened species - Sustainably managing 50 per cent of natural ecosystems and considering them in spatial planning - Implementing rehabilitation plans for at least 20 per cent of degraded sites to safeguard ecosystems - Restoring, by 2027, 25 per cent of climate-vulnerable riparian areas identified in a feasibility assessment as biodiversity corridors - Establishing two facilities for ex situ conservation of flora and fauna in vulnerable regions by 2025
Freshwater resources	**Supply** - Ensuring access to clean safe water for 100 per cent of the population in urban and rural areas in 2015–2030 (from 86 and 67.7 per cent, respectively) - Ensuring that 99 per cent of the population has access to basic water supply and 40 per cent to improved water supply by 2030 - Increasing potable water supply per capita from 19 to 25 l in rural areas and from 50 to 100 l in urban areas in 2018–2025 - Ensuring that 100 per cent of water-climate vulnerable rural communities can address water needs in normal and climate-stressed times by 2030 - Strengthening equitable distribution of and access to water for 20 per cent of the population living in climate-vulnerable communities - Reducing water in the national index of unsatisfied basic needs to 0.02 per cent - Reusing 95 per cent more treated water by 2036, recycling 10 per cent of wastewater by 2030 and treating 68 per cent of wastewater by 2030 - Increasing desalinated water supply by 50 per cent by 2036/in 2015–2025 - Desalinating 50 per cent of water used for tourism-related purposes - Reducing hydro-inefficiency and water losses in water supply systems and desalination plants from 30 to 10 per cent in 2021–2030 - Building 50 dams with a storage capacity of 11 billion m^3 by 2050 - Increasing dam production by 5 per cent - Restoring, rehabilitating and augmenting 25 reservoirs, 300 irrigation systems and 200 km irrigation canals by 2030 - Increasing water storage capacity from 596 million to 3,779 million m^3 by 2030

Priority area	Quantified targets
	- Creating a rainwater harvesting system for collecting 300 million m³ water per year
	- Establishing rainwater harvesting as a practice in at least 25 per cent of households
	- Protecting 70 per cent of main aquifers in 2021–2025
	- Increasing groundwater resource assessment coverage from 18 to 35 per cent in 2018–2030
	- Reducing overexploitation of water tables by 50 per cent by 2030
	- Increasing surface water resource assessment coverage from 78 to 100 per cent in 2018–2030
	- Increasing the share of social organizations with resilient water systems from 35 to 80 per cent
	Demand
	- Reducing water consumption by 20 per cent by 2036
	- Reducing water loss by 20 per cent in 2021–2025/from 39 to 20 per cent in 2018–2030
	- Increasing by 40 per cent the number of companies participating in water efficiency initiatives
	- Implementing metering in all public buildings
	- Reducing non-treated sewage by 25 per cent
	- Inspecting water quality in 95 per cent of health systems
	- Implementing 84 structural and 30 non-structural flood management measures
	- Creating a risk management plan for 30 per cent of highly vulnerable municipalities
	- Providing 100 per cent waste disposal coverage by 2030
	Other
	- Increasing access to the sanitation network by 90 per cent in urban areas and 50 per cent in rural areas
	- Improving drinking water distribution networks for industrial and tourism purposes with a target of 80 per cent as a national average by 2040 and 85 per cent by 2050
	- Adopting integrated river basin management in 15 prioritized river basins by 2030
	- Establishing salinity barriers by 2030 in three rivers where intake is subject to saline water intrusion during drought season
	- Meeting 100 per cent of energy demand in the water sector with off-grid renewables by 2030
	- Reducing water vulnerability from 0.51 to 0.30 units according to a national vulnerability index by 2030
	- Increasing water adaptive capacity from 0.23 to 0.69 units according to a national index by 2030
Human health	- Ensuring that all health companies and authorities have developed disaster risk management plans
	- Achieving all the Sustainable Development Goals for health
	- Ensuring that 40 per cent of health institutions implement adaptation approaches by 2030
	- Building 10 new healthcare centres in low-climate-risk areas
Key economic sectors and services	- Increasing the share of households using off-grid renewable energy for lighting from 39 to 100 per cent in 2018–2030
	- Increasing the percentage of the population with stable access to electricity via alternative off-grid renewable energy from 11 to 35 per cent in 2018–2030
	- Increasing renewable energy contribution to the energy mix from 9 to 27 per cent in 2018–2030/from 39 to 79 per cent in 2010–2030
	- Increasing electricity generation from 1,625 to 13,387 MW in 2010–2030
	- Investing USD 1.2 billion in climate-resilient transport infrastructure
	- Increasing the number of cities and towns with dedicated bicycle lanes from 2 to 69 in 2018–2030
	- Increasing the number of transport infrastructure operations that consider climate change from one to nine in 2018–2030
	- Enhancing resilience of 4,500 km road infrastructure
	- Ensuring that 10 per cent of enterprises have implemented adaptation efforts
	- Retrofitting 30,000 buildings to be sustainable by 2030
	- Creating 14,000 ha green infrastructure

Priority area	Quantified targets
Coastal and low-lying areas	- Ensuring that 20–70 per cent of coasts have protection measures in place
Ocean ecosystems	- Defining 30 per cent/10 per cent of exclusive economic zones as marine protected areas
	- Increasing coastal and marine protected areas by 50 per cent by 2030
	- Establishing 10 new marine protected areas by 2030
	- Protecting at least one island, reef and area of wetlands in each atoll
	- Protecting 20 per cent of blue carbon habitats in 2021–2025
	- Rehabilitating 80 per cent of mangroves in key areas
	- Planting 30 million mangrove seedlings by 2030
	- Expanding mangrove forest area by 5 per cent in 2018–2030
	- Protecting 50 per cent of seagrass and mangrove ecosystems by 2025 and 100 per cent by 2030
	- Restoring 1,000 ha coastal ecosystems, including mangroves, by 2030
	- Transplanting 10,000 coral reefs in 10 years and cultivating 1.5 million colonies in five years
Urban areas and other human habitats	- Relocating families living at 2,500 flood-prone or contaminated sites by 2020
	- Increasing the proportion of urban dwellers residing in safe housing to 70 per cent by 2030
	- Increasing the number of landfill sites in climate-resilient locations from 6 to 200 in 2018–2030
	- Increasing the area of land covered by green infrastructure and recreational areas from 159,253 to 5.3 million ha in 2018–2030
Livelihoods	- Implementing adaptation measures targeting 50 per cent of vulnerable communities identified in the national vulnerability atlas
	- Ensuring the ability of 80 per cent of small- and medium-sized enterprises to generate income for essential household needs/services in normal and climate-stressed times by 2022
	- Increasing the number of green jobs from 200,000 to 5 million in 2018–2030
	- Increasing earnings from exporting sustainable forest products from USD 41.4 million to 221 million in 2018–2030
	- Increasing the number of dependent people benefiting from climate-resilient wildlife resources from 30,000 to 1.5 million in 2018–2030
Disaster risk management and early warning	- Introducing extreme weather event early warning systems for 70 per cent of the population
	- Increasing the number of analysed and disseminated climate and early warning data sets from 15 to 59 in 2018–2030
	- Increasing the number of modern weather stations from 325 to 806 in 2018–2030

Figure 2
Synergies between efforts in adaptation priority areas and efforts towards Sustainable Development Goals identified in adaptation components of nationally determined contributions

Note: The shading reflects the frequency of identification by Parties of synergies between adaptation efforts in priority areas and efforts towards the Sustainable Development Goals; the darker the shading, the more frequently specific linkages were identified.