Chapter 9

Indicative Actions, Institutions, and Timeframe for Building a Climate Change Adaptation, Disaster Risk Reduction, and Food Security Roadmap for Myanmar

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CHAPTER 9

Indicative Actions, Institutions, and Timeframe for Building a Climate Change Adaptation, Disaster Risk Reduction, and Food Security Roadmap for Myanmar

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This roadmap is intended for the period 2018–2030 and is to be implemented in each of Myanmar's six key sectoral areas. These are: (i) agriculture, fisheries, and livestock; (ii) the environment and natural resources; (iii) energy, transport, and industry; (iv) cities, towns, and human settlements; (v) climate hazards and health; and (vi) education, science, and technology.

The following six action areas have been set up as objectives for each sector: policy, institution, finance, capacity and technology, awareness, and partnership. The activities under each action area range from ongoing projects and sectoral activities that need to be continued and strengthened, to new projects that need to be initiated.

The timeframe is set as 3 years for short term, 6 years for medium term, and 12 years for long term, depending on the nature of work to be done. During each timeframe, the actions to be undertaken are prioritised under three categories based on their importance and the urgency of the need for them. The availability of funds for the actions to be taken is also taken into consideration.

There are 191 actions to be taken under the six key sectoral areas; although this may appear excessively detailed, some of these actions are simple, such as forming a group or conducting a study, and some can be accomplished collectively by carrying out a project in a selected area. In designing the projects, much consideration should be given to including as many of these actions as possible, depending on the funds available. Some actions are included in the ongoing projects, while others are yet to be formulated in terms of projects or programmes. Relevant stakeholders should be invited to a workshop to prepare project proposals to ensure that all of the identified actions are included in a number of project designs.

9.1 Climate-Smart Agriculture, Fisheries, and Livestock for Food Security

9.1.1 | Sectoral Outcome

The sectoral outcome is climate-resilient productivity and climate-smart responses in the agriculture, fisheries, and livestock sectors to support food security and livelihood strategies while also promoting resource-efficient and low-carbon practices.

Table 9.1: Expected Results and Strategic Indicators

Expected Sectoral Results	Strategic Indicators
The agriculture, fisheries, and livestock sectors have integrated climate change into their relevant policies, planning, and budgeting procedures and have put these into practice, depending on local specialties and taking gender considerations into account.	• Number of sectoral polices, plans, research and development strategies, and extension services that integrate climate change and are practiced at the national, subnational, and local levels • Number of officials trained on sector-specific guidelines and tools for integrating climate change into planning and budgeting systems • Number of sectors, geographical areas, and technology-specific institutional arrangements, including a multi-stakeholder engagement framework developed to implement climate-change responses at the national, subnational, and local levels • Number of climate change adaptation projects implemented through externally supported finance and domestic resources • Number of climate-smart technologies and good practices that are in harmony with local requirements and favor small and medium-sized farmers introduced and scaled up in the Central Dry Zone, the Ayeyarwady Delta, and coastal zone and lowland areas • Number of farmers (both men and women) benefiting from the introduction of climate-smart technologies and other responses • Number of multi-stakeholder partnerships that support the scaling up of climate-resilient and low-carbon responses
The agriculture, fisheries, and livestock sectors have adopted climate-resilient and environmentally sound adaptation technologies and climate-smart management practices, supported by international and domestic finance, with special emphasis on small- and medium-scale production needs.	
Institutional coordination and a multi-stakeholder engagement framework have been established and support the implementation of climate-smart responses in the agriculture, fisheries, and livestock sectors, including innovative business models and gender-sensitive approaches.	

Source: MNREC, 2018.

9.1.2 | Objectives for Action Areas

The objectives for the action areas are as follows:

(i) Integrate climate adaptation, disaster risk management, and food security in policies, plans, research and development strategies, and extension services at the national, sectoral, and local levels.
(ii) Establish and reinforce institutional arrangements to plan and implement climate change responses.
(iii) Establish financial mechanisms to mobilise and allocate resources for climate change response and climate-responsive development.
(iv) Increase access to climate-resilient and low-carbon technologies and practices.
(v) Enhance awareness and capacity to promote and implement climate-resilient and low-carbon responses.
(vi) Promote multi-stakeholder partnerships to support and scale up climate-resilient and low-carbon responses.

9.1.3 | Actors

The lead actor is the Ministry of Agriculture, Livestock and Irrigation (MOALI), which includes the following departments: (i) the Department of Agriculture (DOA); (ii) Department of Agricultural Research; (iii) Department of Rural Development; (iv) Department of Planning; (v) Department of Agriculture Land Management and Statistics; (vi) Agriculture Mechanization Department; (vii) Irrigation and Water Utilization Management Department (IWUMD); (viii) Directorate of Livestock, Fisheries and Rural Development; (ix) Livestock Breeding and Veterinary Department; (x) Department of Fisheries; and (xi) Department of Planning.

Other actors are (i) academic and research institutions (ARIs), such as agricultural and forestry universities; (ii) the Ministry of Natural Resource and Environment Conservation (MONREC); (iii) the Environmental Conservation Department (ECD); (iv) regional and state governments for addressing local priorities; (v) the Ministry of Planning and Finance (MOPF); (vi) the Ministry of Transport and Communication (MOTC); (vii) the Department of Meteorology and Hydrology (DMH); (viii) the Ministry of Health and Sports (MOHS); (ix) the Ministry of Industry (MOI); (x) the Ministry of

Education (MOE); (xi) the Ministry of Construction (MOC); (xii) the Ministry of Social Welfare, Relief and Resettlement (MOSWRR); (xiii) local government at the regional, district, and township levels; (xiv) development partners, including the European Union, Department for International Development, Asian Development Bank, Food and Agriculture Organization (FAO), United Nations Development Program (UNDP), and UN Environment Program (UNEP); (xv) farmer and fishery groups and co-operatives; (xvi) national nongovernment organisations (NGOs) (including women's NGOs); (xvii) international NGOs; (xviii) international agencies; (xix) international financing institutions (IFIs); (xx) civil society organisations (CSOs); (xxi) community-based organisations (CBOs); (xxii) the private sector; and (xxiii) the media.

9.1.4 | Climate-Resilient Agricultural Productivity Is Achieved to Support Food Security, Livelihood Strategies, Gross Domestic Product Growth, and Greenhouse Gas Reductions

Objective for Action Area 1: **Integrate Climate Adaptation, Disaster Risk Management, and Food Security in Policies, Plans, Research and Development Strategies, and Extension Services at the National, Sectoral, and Local Levels**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop guidelines (tools, contents) to mainstream climate change into agriculture, fisheries, livestock, and irrigation.	Guidelines for mainstreaming climate change developed	First				MOALI	MONREC (ECD), MOPF
Pilot and promote inclusive and participatory adaptation planning at the local level to integrate climate change in local government, CSO, and CBO agriculture and livelihood plans.	Local adaptation plans prepared at the local level	First				MOALI	MONREC, NGOs, CBOs
Develop a climate change research and extension strategy for the agriculture, fisheries, and livestock sectors, including an action plan for a climate-smart agriculture strategy.	Research and extension strategy, including an action plan, developed	Second				MOALI	MONREC

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Objective for Action Area 1: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop guidelines and action plan to mainstream gender in climate change-related policies for the agriculture, fisheries, livestock, and irrigation sectors.	Guidelines and action plans on a climate change-related perspective on gender in the respective sectors developed	Third		■		MOALI	MONREC
Develop training modules for fishers and farmers on how to integrate climate change into local-level planning.	Training module on climate change integration developed	Second	■			MOALI	MONREC, NGOs, CBOs
Implement efficient water management practices in vulnerable townships and states, including mountainous and flood-prone areas, delta regions, and the Dry Zone.	Water management technologies adopted by farmers	First		■		MOALI (Department of Agricultural Research)	MONREC (ECD), local government, CSOs, IWUMD
Implement eco-friendly crops and bio-energy schemes targeting climate vulnerable households in Shan State and the Dry Zone.	Farmers have increased access to eco-friendly crops and bio-energy schemes	First		■		MOALI	PS, MOEE
Identify and implement livelihood diversification activities (both on- and off-farm) in vulnerable areas of Dry Zone, delta, mountainous, and coastal areas, targeting poor and landless households.	Vulnerable households have improved access to livelihood diversification activities	First			■	MOALI	MONREC, NGOs, CBOs
Develop a mitigation and low-carbon strategy, including a plan for the agriculture, fisheries, and livestock sectors, in line with Myanmar's nationally determined contribution (NDC) and Climate Smart Agriculture Strategy.	National mitigation and low-carbon development strategy and plan in place	First	■			MOALI	MONREC (ECD), MOPF
Implement information and communications technology (ICT)-based monitoring system and retrofitting works in irrigation systems for effective water management by using geospatial technologies.	Water management technologies practiced by irrigation engineers	First		■		MOALI (IWUMD)	Local government, international agencies

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 2: Establish and Reinforce Institutional Arrangements to Plan and Implement Climate Change Responses

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Establish national-level climate change and agriculture, fishery, and livestock working groups to improve coordination and synergy.	Climate change working groups established	First	■			MOALI	MONREC (ECD), MOPF
Establish a climate change cell or division within the MOALI.	Climate change cell or division within the MOALI established	First	■			MOALI	MONREC (ECD), MOPF
Establish institutional platform to exchange learning and share knowledge on climate-smart agriculture, fisheries, and livestock.	Learning and knowledge-sharing forum on climate-smart agriculture, fisheries, and livestock established	First			■	MOALI	MONREC (ECD), MOPF
Develop terms of reference for a climate change cell and human resource capacity to integrate climate change within the MOALI.	Human resource development plan for climate change capacity building developed	First	■			MOALI	MONREC (ECD), MOPF
Conduct a gender analysis and develop capacity to integrate gender perspectives into climate change responses to agriculture.	Gender and climate change working groups established and gender analysis developed	Third			■	MOALI	MONREC (ECD), MOPF
Develop institutional guidelines and strategies for promoting decentralised community institutions for effective climate change response.	Guidelines and strategy for decentralised community institutions developed	Third			■	MOALI	MONREC (ECD), MOPF
Establish and strengthen cooperatives for farmers, fishers, water users, and herder associations to deal with climate change issues collectively.	Cooperative, associations, and groups capacitated on climate change	First	■			MOALI	MONREC (ECD), MOPF

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 3: Establish Financial Mechanisms to Mobilise and Allocate Resources for Climate Change Response and Climate-Responsive Development

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop, integrate, and legalise a risk-based insurance system to cover the loss of and damage to crops, livestock, and fisheries due to climate-induced disasters.	Risk-based insurance system either integrated into existing legislation or new laws and regulations developed	First				MOALI, MOPF	Local government, farmer groups and cooperatives, private sector
Establish and promote microcredit cooperatives to increase access to financing for small enterprises, benefiting vulnerable households.	Microcredit cooperatives established	First				MOALI	Local government, NGOs CBOs, development partners, private sector
Develop the budget guidelines and spending tracking system within the MOALI to integrate climate change in annual budgeting.	Budget guidelines and spending tracking system developed	Second				MOALI	MOPF, development partners
Identify and promote financial incentive mechanisms—such as loans, microcredit, and grants—targeting vulnerable households in the Dry Zone and delta areas, with gender considerations based on gender analysis.	Farmers have improved access to financial incentive mechanisms	First				MOALI	MOPF, private sector
Integrate climate change economic and investment appraisal criteria—such as cost benefit analysis—into internal MOALI strategy and plans.	Economic and investment appraisal criteria integrated	First				MOALI	MOPF, private sector

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 4: Increase Access to Climate-Resilient and Low-Carbon Technologies and Practices

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Identify and promote existing climate-smart agricultural technology and practices such as efficient and improved water management technologies that are suitable for Dry Zone, delta, mountainous, and coastal areas; and prepare the extension materials.	Efficient water management technologies and practices promoted, including micro and drip irrigation, rainwater harvesting, small- and medium-scale irrigation schemes, and mobile water pumping facilities	First	■			MOALI	Local government, ARIs including private sector, NGOs, CBOs, international agencies
Provide training to farmers and fishers on climate-smart agriculture technologies and practices—such as improved soil and nutrient management, improved cropping, and community aquaculture—with gender considerations based on gender analysis.	Farmer and fisher capacity for climate-smart technology enhanced	First	■			MOALI	Local government, NGOs, CBOs, international agencies
Establish and promote climate-smart villages that focus on integrated soil and pest management and technology demonstration and generating climate change knowledge.	Climate-smart villages established	Second		■		MOALI	Local government, NGOs, CBOs, international agencies
Carry out infrastructure design and studies to protect agricultural land in coastal and delta areas from saltwater intrusion.	Infrastructure design and studies carried out	First	■			MOALI	MOSWRR, MOC
Implement dam instrumentation, hydro-meteorological monitoring, and forecasting models for operating reservoirs in the context of climate change; and monitor reservoir areas using geospatial technologies.	Emergency operation procedure developed	First	■			MOALI (IWUMD)	MONREC, international agencies
Improve reservoir system performance for sustainable water management under climate change.	Increased water productivity	First	■			MOALI (IWUMD)	MONREC, international agencies
Establish real-time hydro-meteorological monitoring and warning systems in the reservoir area using ICT and geospatial technologies.	Early warning system established at dam sites and nearby	First	■			MOALI (IWUMD)	MONREC, international agencies

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Objective for Action Area 4: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop and promote early maturing and heat-tolerant rice varieties to cope with drought and water stress in Dry Zone, delta, and coastal areas.	Suitable stress-tolerant varieties or breeds developed and disseminated in dry, delta, and coastal areas	First				MOALI	Local government, ARIs, NGOs, private sector, international agencies
Improve high-quality seed-producing facilities by encouraging PPP and collaborating with international research organisations.	Farmers can easily access high-quality seeds and their market is driven by demand	High				MOALI (ARIs), private sector	MOE, MOPF, development partners
Promote a community-based seed bank in Dry Zone areas to increase access to resilient seed and planting materials.	Farmers have improved access to climate-resilient seed and planting materials	Third				MOALI	Local government, ARIs, NGOs, private sector, international agencies
Promote stress-tolerant fish and livestock breeds, targeting vulnerable households in the Dry Zone, delta, and coastal areas.	Stress-tolerant breeds identified and promoted	First				MOALI	Local government, ARIs, NGOs, private sector, international agencies
Establish an early warning system, auto rain-gauge, telemetry, and auto water level-monitoring system in the lower delta region; and share the data with relevant international organisations in exchange for information.	Early warning systems, auto rain-gauge, telemetry, and auto water level-monitoring system established	First				MOALI (irrigation)	MONREC, international agencies
Introduce low-emission farming technology and practices, targeting farmers in climate-impacted regions (dry, coastal, delta, and hilly zones; and flood-prone areas), with gender considerations based on gender analysis.	Low-emission farming technology and practices promoted	Second				MOALI	MONREC, international agencies, MOE
Test and promote ecofriendly plans and bioenergy schemes in selected Dry Zone townships.	Dry Zone townships have ecofriendly plans and bioenergy schemes	Second				MOALI	MONREC, international agencies, MOE
Establish three pilot stations for climate change research (crop, fishery, and livestock improvement research).	Pilot stations for crop, fishery, and livestock improvement research established and operating	Second				MOALI	ARIs, MONREC, international organisations
Promote fuel-efficient agro-machineries, residue management, and reduced tillage practices and technology.	Fuel-efficient machineries and systems promoted	Second				MOALI	MONREC, international agencies, MOE

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 5: **Enhance Awareness and Capacity to Promote and Implement Climate-Resilient and Low-Carbon Responses**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Establish climate change database management system at the MOALI.	Climate change database management system established	Second			■	MOALI	Local government, international agencies
Provide training to the MOALI monitoring unit on approaches to improve climate risk analysis and related data monitoring and management.	Training provided to staff of the MOALI monitoring unit	Second			■	MOALI	Local government, international agencies
Develop flood hazard maps in flood-prone areas to assess the agricultural damage based on climate change projection.	Flood hazard maps developed	First		■		MOALI	MOTC (DMH), international agencies, MONREC
Build capacity to develop national and regional monitoring and surveillance plans for the fisheries sector.	National and regional monitoring and surveillance system in place	Second			■	MOALI	MOTC (DMH), international agencies, MONREC
Build capacity to establish more agro-meteorological and hydro-met stations to strengthen weather and climate information and collaborate with international meteorological institutions.	Agro-meteorological and hydro-meteorological stations established Share and exchange meteorological information and improve accuracy in prediction	First	■			MOALI (DOA, IWUMD)	Local government, international agencies
Carry out training for farmers on using agro-meteorological and climate information.	Farming practices based on agro-meteorological and climate information	First	■			MOALI (DOA)	Local government, international agencies
Build capacity to carry out hydrological analysis in all flood-sensitive areas.	Hydrological analysis carried out	Second		■		MOALI (DOA, IWUMD)	MONREC, international agencies

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Objective for Action Area 5: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Carry out advanced trainings for hydrologic and hydraulic modeling with earth observation systems, and set up technical cooperation with international agencies.	Improved hydrologic and hydraulic analysis	Second		■		MOALI (DOA, IWUMD)	International agencies
Strengthen capacity to improve land use maps of vulnerable townships in the Dry Zone, delta, and coastal areas.	Improved land use maps for climate-vulnerable areas	First	■			MOALI	MOTC (DMH), MONREC
Establish an agriculture information management system and agro-advisory mechanism for improving farmers' access to climate-relevant information.	Agriculture information management system and agro-advisory mechanism established and promoted	First	■			MOALI, MOTC (DMH)	MOIN, local government, NGOs, CBOs, international agencies, media
Carry out climate change awareness-raising and capacity-building activities, targeting extension agents and government staff.	Government staff trained on climate change	Second	■			MOALI	MOI, MOTC, local government, CSOs, media
Provide climate change training for staff of ARIs so they can generate climate-relevant information and knowledge.	Academics and researchers trained on climate change	Third			■	MOALI	MOI, MOTC, local government, CSOs, media
Establish environment clubs or societies in schools and universities and support them to integrate climate change within their activities.	Environment clubs and societies established	Third			■	MOALI	MONREC (ECD), local government, NGOs
Develop farmer-friendly, gender-sensitive training, and awareness-raising materials to address climate change.	Training and awareness-raising materials produced and used	Second			■	MOALI	MOI, MOTC, local government, CSOs, media
Provide awareness and training on improved water, soil-nutrient, pest, and disease management practices, with gender considerations.	Farmers trained on improved management practices	First		■		MOALI	MOI, MOTC, local government, CSOs, media

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 6: Promote Multi-Stakeholder Partnerships to Support and Scale Up Climate-Resilient and Low-Carbon Responses

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Establish national, regional, district, and township-level multi-stakeholder climate change response committees.	Multi-stakeholder climate change response committee established	First				MOALI	MONREC (ECD), local government, NGOs
Develop guidelines and regulations to enable private sector and other stakeholder investment on risk financing.	Private sector partnerships for investment in insurance and contract farming promoted	First				MOALI	MOPF, private sector
Develop collaborative projects targeting one-third of the most vulnerable households in five states/ regions on an annual basis.	Collective actions promoted amongst different actors to address climate change impacts at the local level	First				MOALI	DPs, private sector, CBOs
Establish a national-level, multi-stakeholder engaged risk-based financing mechanism (loss and damage fund and modality) to support climate-vulnerable households.	Multi-stakeholder engaged risk-based financial mechanism established	First				MOALI, MOPF	IFIs, private sector, MONREC (ECD)

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

9.2 Sustainable Management of Natural Resources for Healthy Ecosystems

9.2.1 | Sectoral Outcome

The sectoral outcome is natural resource management that enhances the resilience of biodiversity and ecosystem services that support social and economic development and deliver carbon sequestration.

Table 9.2: Expected Results and Indicators

Sectoral Expected Results	Strategic Indicators
Climate change dimensions are incorporated and enforced in environment and natural resource management policies, rules, and regulations.	• Number of policies, strategies, laws, and by-laws that integrate climate change, including resilient and low-carbon provisions • Number of officials trained on sector-specific guidelines and tools for integrating climate change into planning and budgeting systems • Number of sector- and technology-specific mitigation and adaptation action plans implemented in regions or areas with higher deforestation and degradation issues • Number of households, NGOs, and CBOs benefiting from access to, and implementation of, environmentally sound technologies and good management practices, including ecosystem-based adaptation approaches, with training • Number of geographical areas covered and technology-specific institutional arrangements—including multi-stakeholder engagement frameworks—developed to implement climate change responses at the national, subnational, and local levels • Number of climate change projects implemented through externally supported finance and domestic resources that address issues in the natural resources management sector
Environmentally sound technologies and good management practices are adopted for improving and maintaining forest, water, land, and coastal ecosystem health and services.	
Framework for institutional coordination and multi-stakeholder engagement is established and supports access to finance and the implementation of responses for health, environment, and natural resource management.	

Source: MNREC, 2018.

9.2.2 | Objectives for Action Areas

The objectives for the action areas are as follows:

(i) Integrate climate adaptation, disaster risk management, and food security in policies, plans, research and development strategies, and extension services at the national, sectoral, and local levels.

(ii) Establish and reinforce institutional arrangements to plan and implement climate change responses.
(iii) Establish financial mechanisms to mobilise and allocate resources for climate change responses and climate-responsive development.
(iv) Increase access to climate-resilient and low-carbon technologies and practices.
(v) Enhance awareness and capacity to promote and implement climate-resilient and low-carbon responses.
(vi) Promote multi-partnership mechanisms for enhancing climate resilience and low-carbon development in the environment and natural resource management sectors.

9.2.3 | Actors

The lead actor is the MONREC, which includes the following departments: (i) the Forest Department; (ii) Department of Planning, Environmental Conservation Division (ECD); (iii) Dry Zone Greening Department (DGZD); and (iv) National Environmental Conservation and Climate Change Committee (NECCCC).

Other actors are (i) the MOALI (IWUMD); (ii) Ministry of Electricity and Energy (MOEE); (iii) Ministry of Hotels and Tourism (MOHT) (Directorate of Hotels and Tourism); (iv) Ministry of Planning and Finance (MOPF); (v) MOTC (Department of Meteorology and Hydrology [DMH]); (vi) Ministry of Industry (MOI); (vii) Ministry of Home Affairs (MOHA) (Department of General Administration [GAD]); (viii) Ministry of Information (MOIN); (ix) National Water Resources Committee; (x) local government (regional, district, and township); (xi) NGOs, for example, the Myanmar Environment Restoration Network, the Renewable Energy Association of Myanmar, Eco-Conscious Developments, the World Wildlife Fund, the Ecosystem Conservation and Community Development Initiative (Spectrum-Sustainable Development Knowledge Network, Green Lotus, and Forest Resource Environment Development and Conservation Association; (xii) ARIs (Forestry University, departments of botany, arts and science, and environment science); (xiii) development partners; (xix) international agencies; (xx) international financing institutions (IFIs); (xxi) community forestry user groups (CFUGs); (xxii) buffer zone user groups; (xxiii) CSOs; (xxiv) CBOs; (xxv) other groups, such as women's groups; (xxvi) the media; and (xxvii) the private sector.

9.2.4 | Management of Natural Resources for Healthy Ecosystems

Objective for Action Area 1: Integrate Climate Adaptation, Disaster Risk Management, and Food Security in Policies, Plans, Research and Development Strategies, and Extension Services at the National, Sectoral, and Local Levels

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Integrate climate change in the new environment policy and law, and in existing sectoral policies such as forest, water, tourism, and land use.	Climate change integrated in environment, tourism, land use, and forest policy and laws	First	■			MONREC, MOHT, MOALI	MOPF, development partners
Support the preparation of climate change policies, National Adaptation Plan, Green Growth Strategy, National Appropriate Mitigation Actions, and Low-Carbon Development Strategy.	Climate change adaptation and mitigation policies and strategies developed and legalised	First	■			MONREC, MOHT, MOALI	MOPF, development partners
Develop climate change vulnerability assessments and local adaptation and resilience plans in all townships and cities.	All townships and cities of Myanmar have vulnerability assessments, or at least simplified vulnerability analysis All townships and cities of Myanmar have local adaptation plans or adaptation and resilience measures integrated into their planning	First			■	MONREC (ECD), MOC (DUHD)	MOHA (GAD)

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Objective for Action Area 1: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Integrate gender considerations and guidelines in the NDC implementation action plan, 'reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries' (REDD+), and the National Adaptation Plan.	Climate change adaptation and mitigation policies and strategies developed with a gender perspective	Third				MONREC	MOPF, development partners
Prepare REDD+ and NDC implementation action plan to integrate climate change into the national legal framework and development plans.	NDC and REDD+ policies, strategies and plans integrated in national laws, policies, and development plans	First				MONREC, and individual departments	MOALI, CBOs, NGOs, international agencies, private sector
Integrate climate into guidelines for inventory (forest, greenhouse gases [GHGs]), monitoring (National Forest Monitoring and Information), and mapping.	Guidelines for inventory, monitoring, and mapping developed or updated	First				MONREC	MOALI, MOTC (DMH), MOHA (GAD), MOPF, MOHT
Develop climate screening/ proofing and planning guidelines and tools to climate-proof investments.	Climate screening and planning guidelines and tools developed	Second				MONREC	MOALI, international agencies, MOI, MOEE, MOPF, private sector
Develop/update existing compliance systems (environmental impact assessment (EIA), strategic environmental assessment [SEA], and social impact assessment [SIA]) to include climate risk management and mitigation plans.	An EIA, SIA, and SEA applied to enforce compliance to risk reduction and mitigation plans, for example, in mining, large infrastructure construction, and industry	First				MONREC	MOALI, MOI, MOEE, international agencies, MOPF, private sector
Develop and implement adaptation and mitigation action plans for critical ecosystems including coastal areas, wetlands (such as Inle lake), watersheds, and catchment areas.	Action plans for critical ecosystems developed and implemented	First				MONREC (ECD and other departments)	Local government, CBOs, NGOs, development partners

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Objective for Action Area 1: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Identify and promote successful climate-resilient, ecosystem-based adaptation practices that are suitable for different eco-regions and forest conditions.	Successful climate-resilient, ecosystem-based adaptation practices suitable for different eco-regions and forest conditions identified and promoted	First				MONREC (ECD and other departments)	CBOs, NGOs, development partners
Implement livelihood diversification activities—such as skill-oriented training on enterprise development, value addition, and marketing targeting—to community forestry user group (CFUG) members, including landless, women, and other vulnerable households.	Improved access to livelihood diversification options for forest-dependent communities	First				MONREC, MOALI	MOPF, CBOs, private sector, international agencies
Introduce microfinance and credit facilities to support climate-smart, diversified livelihood options for poor households in vulnerable townships or districts to male and female-headed households.	Microfinance and credit facilities promoted, targeting vulnerable townships and districts to all households, ensuring that female-headed households are included and separately monitored	First				MONREC, MOALI	MOPF, CBOs, private sector, international agencies
Develop policy guidelines and directives to establish gene bank to protect species under threat from climate change.	Forest gene bank policy and guidelines established	Third				MONREC (DOF, ECD)	Local government, NGOs, international agencies
Pilot and scale up REDD+ activities in areas where deforestation and degradation is high and in critical forest areas.	REDD+ actions implemented, contributing to the control of deforestation and degradation	Second				MONREC (DOF, DZGD)	MOALI, international agencies, public sector, private sector

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 2: Establish and Reinforce Institutional Arrangements to Plan and Implement Climate Change Responses

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Initiate meetings and discussion to harmonise and align existing co-ordination mechanisms—such as the Myanmar Climate Change Alliance and the NECCCC—to integrate climate change.	Coordination amongst ministries and institutions in relation to climate change policies improved	First	■			NECCCC, MONREC	ECD
Develop training courses and curriculum on climate change integration, assessment and planning, including monitoring and evaluation.	Forestry professionals' and practitioners' capacity on climate change assessment and planning improved	Second	■			MONREC (DOF, ECD) ARIs	MOALI, MOE, MOHT, MOHA (GAD)
Organise discussion forums to strengthen climate change portfolio within the ECD and its departments.	Climate change department or section established and strengthened within the MONREC	Second	■			MONREC (ECD)	MOPF, development partners
Develop local-level institutional mechanisms to integrate climate change within the subnational and local plan and activities, with a gender perspective.	Decentralised institutional coordination mechanism developed	First		■		MONREC (ECD)	MOPF, development partners

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 3: Establish Financial Mechanisms to Mobilise and Allocate Resources for Climate Change Response and Climate-Responsive Development

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop fund management and operating guidelines to operationalise an environmental management fund.	Fund management and operating guidelines developed	First				MONREC (ECD), MOPF	Bilateral and multilateral agencies, IFIs, private sector
Develop an innovative climate fund mechanism—such as Payment for Eco-System Services or carbon credits—and guidelines at the national and subnational levels (within MONREC-ECD).	Innovative climate fund established	First				MONREC (DF, DZGD), MOALI	Local government, CBOs, NGOs, international agencies such as the Green Climate Fund (GCF)
Develop a national-level climate financing strategy and roadmap (accessing source and investment areas) to secure investment on climate change.	Strategy and plans to harness international financing to ensure the development of a credits or incentives mechanism	First				MONREC (ECD)	MOPF, MOALI, MOHT
Develop guidelines and procedures for meeting international standards for fund access—for example, the GCF or Adaptation Fund) with gender-sensitive requirements.	Guidelines and procedures for meeting international standards for funds developed	Third				MONREC (ECD)	MOPF, MOALI, MOHT
Develop bankable projects to implement climate change adaptation and mitigation priorities.	Bankable climate change projects developed	First				MONREC (ECD)	MOPF, MOALI, MOHT

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 4: Increase Access to Climate-Resilient and Low-Carbon Technologies and Practices

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop, test, and scale up sustainable soil and water management technologies and practices in climate-vulnerable areas.	Alternative technologies and land use practices for managing deforestation and degradation piloted and promoted	First			■	MONREC	Local government, CBOs, CFUGs, MOALI, NGOs
Organise events to improve farmers' technological access to climate-smart technology and practices—for example, improved land management practices such as agroforestry—with gender considerations.	Increased farmer access to climate-smart technologies	First		■		MONREC	Local government, CBOs, CFUGs, MOALI, NGOs
Establish forest gene banks and conservation zones targeting climate-sensitive ecosystems such as mangroves and wetlands.	Gene bank and species conservation zones established	Second			■	MONREC	Local government, CBOs, CFUGs, MOALI, NGOs
Implement energy efficiency plans focusing on biomass conservation—for example, improving fuel-wood use efficiency through technology, energy-efficient stoves, biogas, or bio briquettes—with gender considerations in the most vulnerable townships, targeting a number of households.	Energy efficiency schemes and biomass conservation implemented	First	■			MONREC, MOEE	MOPF, MOEE, CSOs, private sector, international agencies

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 5: **Enhance Awareness and Capacity to Promote and Implement Climate-Resilient and Low-Carbon Responses**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop plan and materials for climate change awareness and capacity development (for training of trainers).	Climate change awareness and capacity-building plan developed	Second	■			MOE, MONREC (ECD)	MOHA (GAD), MOALI, MOIN, CSOs, international agencies, media, NGOs, local government
Implement training and awareness-raising activities on climate change, targeted at landless, female-headed households and vulnerable communities, including ethnic groups.	Improved public awareness on the importance of ecosystem health and services in light of climate change impacts	Second	■			MOE, MONREC (ECD)	MOHA (GAD), MOALI, MOIN, CSOs, media, local government, NGOs, international agencies
Provide capacity building training on vulnerability and risk assessment (inventory, climate hazard mapping), information management (database system), and dissemination (communication strategy).	The MONREC's capacity to respond effectively to climate change impacts improved	Second		■		MONREC	MOE, MOPF, international agencies, NGOs
Organise capacity-building activities targeted at ARIs to mainstream climate change.	Improved academic and research capacity	First		■		MONREC, MOHA (GAD), ARIs, MOPF	International agencies, private sector
Provide grants for university teachers and students to conduct research on climate change issues within the environment and natural resource management sectors.	Research grants established and operationalised	Second			■	MONREC, MOHT, ARIs	MOPF, MOALI, international agencies
Develop mass communication and dissemination strategy for communicating climate change to local communities with a gender-sensitive communications approach.	Mass communication and dissemination strategy developed	First	■			MONREC, MOIN, media	MOALI, CBOs, development partners

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 6: **Promote Multi-Partnership Mechanisms to Support and Scale Up Climate-Resilient and Low-Carbon Responses in the Environment and Natural Resource Management Sectors**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Establish a climate change, environment, and biodiversity working group involving multiple stakeholders.	Working groups on climate change established	Second				MONREC (ECD, DOF), private sector	Local government, CSOs, international agencies, private sector
Support CFUG and other networks' activities to enhance public participation in addressing climate change issues.	Enhanced coordination and networking amongst CFUGs	Second				MONREC	MONREC, CSOs, local government, international agencies such as the World Wildlife Fund
Develop a strategy and proposals for joint actions to access climate finance—for example, through GCF, Adaptation Fund, Least Developed Countries Fund, or the Climate Investment Fund.	Strategy and proposals on climate finance developed	First				MONREC	MOPF, CSOs, donors
Implement joint collaborative project involving the government, NGOs, development agencies, and international partners in targeted climate-sensitive and vulnerable areas of Myanmar.	Joint collaborative projects implemented at the local level	First				MONREC	MOPF, CSOs, donors

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

9.3 Resilient and Low-Carbon Energy Transport and Industrial Systems for Sustainable Growth

9.3.1 | Sectoral Outcome

The sectoral outcome is climate-resilient and low-carbon energy, transport, and industrial systems that support inclusive and sustainable development and economic growth.

Table 9.3: Expected Results and Indicators

Sectoral Expected Results	Strategic Indicators
Energy security for the country is based on generating a large share of its energy from renewable sources and high energy efficiency in domestic, industrial, and other use.	• Number of sectoral laws and norms inspired by sustainability concerns • Implementation of the Green Growth Framework • High share of energy generated from sustainable, renewable sources within the timeframe of the Myanmar Climate Change Strategy and Action Plan • Number of existing rules and regulations in industrial and transport sectors enforced, to ensure that low-carbon and air quality thresholds are respected at the national and urban levels • Number of incentive schemes in place to support the private sector in transitioning to low-carbon production, investment in renewables, and management of production processes • Number of schemes and programmes that incentivise the introduction of solar power energy generation, biomass, and other sustainable sources of renewable energy • Number of businesses that consider climate change in their business planning to ensure resilience and protect jobs • Number of green jobs created
Transport systems are adapted to heightened risks of disasters from new climatic conditions and made sustainable through efficiency and low-carbon technologies. Agricultural products across the country are easily transported to the markets by improving road network infrastructure.	
Industrial systems are highly productive and competitive due to their climate-resilient, sustainable, low-carbon, and green characteristics.	

Source: MNREC, 2018.

9.3.2 | Objectives for Action Areas

The objectives for the action areas are as follows:

(i) Integrate climate change adaptation and disaster risk reduction (DRR) in policies and plans of the energy, industry, and transport sectors at the national, sectoral, and local levels.
(ii) Establish and reinforce institutional arrangements to plan and implement climate change responses.
(iii) Establish financial mechanisms to mobilise and allocate resources for climate-resilient and low-carbon development.
(iv) Increase access to climate-resilient and low-carbon technologies and practices in the energy, transport, and industry sectors.
(v) Enhance awareness and capacity to promote and implement climate-resilient and low-carbon development responses.
(vi) Promote multi-stakeholder partnerships to support and scale up climate-resilient and low-carbon development responses.

9.3.3 | Actors

The lead actors are the MOEE, MOTC, and MOI's Directorate of Industrial Collaboration. The focal agency alternates between the MOEE, MOI, and MOTC. Other actors are (i) the MONREC (ECD); (ii) MOALI; (iii) MOPF; (iv) MOTC (DMH); (v) MOC; (vi) MOIN; (vii) MOHA; (viii) MOSWRR; (ix) local government at the state, regional, district, and township levels, including city development committees (CDCs); (x) the Myanmar Engineering Society; (xi) the private sector (Union of Myanmar Federation of Chambers of Commerce and Industry); (xii) ARIs; (xiii) NGOs; (xix) international agencies; (xx) IFIs; (xxi) CSOs; (xxii) the media; (xxiii) United Nations (UN) agencies (the UN Industrial Development Organization, UNEP, and United Nations Human Settlements Program [UN-Habitat]); and (xxiv) development partners.

9.3.4 | Resilient and Low-Carbon Energy, Transport, and Industrial Systems for Sustainable Growth

Objective for Action Area 1: Integrate Climate Adaptation and Disaster Risk Reduction Into Energy, Transport, and Industry Policies, Plans, Research and Development, and Extension Services at the National, Sectoral, and Local Levels

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Integrate climate change within existing energy policies, plans, and legal instruments (e.g. the EIA and SEA).	Climate change integrated within existing energy policies, plans, and legal instruments (the new National Energy Master Plan in particular) in a way that helps Myanmar reach its NDC targets	First				MOEE	MONREC (ECD), MOPF, international agencies
Develop a strategic energy plan and investment portfolio that ensure national security and lower GHG emissions through the promotion of renewable energy technologies.	Strategic energy plan and investment portfolio developed using renewable energy technologies	First				MOEE	MONREC (ECD), MOPF, international agencies

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Objective for Action Area 1: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop climate-proofing screening guidelines, methods, and tools to integrate climate change risk into investments.	Climate-proofing screening guidelines, methods, and tools developed	First				MOEE	MONREC (ECD), MOPF, international agencies, private sector, CSOs
Integrate climate change into transport sector policies and plans by developing guidelines and regulations for climate-proofing transport infrastructure, port facilities, roads, railways, and bridges.	Climate change considerations reflected in transport sector policies and plans	First				MOTC, MONREC (ECD)	MOPF, CDCs, local government, private sector
Study the supply chain of different agricultural products, especially rice, and introduce a road network infrastructure plan to improve market access and opportunities for farmers.	Supply chain study of agricultural products conducted and improved by highly interconnected road network infrastructure	First				MOC, MOALI, MOTC, local government	MOPF, private sector, MOHA
Integrate climate change in industrial development planning by developing climate-resilient planning guidelines and tools.	Planning guidelines and tools developed	First				MOI	MOPF, CDCs, private sector, MONREC

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 2: **Establish and Reinforce Institutional Arrangements to Plan and Implement Climate Change Responses**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Improve institutional mechanisms to better assess and plan climate change investment and interventions.	Institutional mechanisms on assessment strengthened	First				MOEE, MOI, MOALI	PS, MONREC, MOTC, development partners, international agencies
Integrate climate change within existing institutional mechanisms (National Energy Management Committee [NEMC]).	Climate change integrated within existing institutional mechanisms (NEMC)	First				MOEE (NEMC), MONREC	MOI, MOALI
Establish and strengthen a climate change cell within the MOEE.	Climate change cell established and strengthened within the MOEE	First				MOEE (NEMC), MONREC	MOI, MOALI

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 3: To Establish Financial Mechanisms to Mobilise and Allocate Resources for Climate-Resilient and Low-Carbon Development

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop a financial investment plan for the energy sector to finance and implement climate-resilient and low-carbon development activities.	Financial mechanisms and guidelines on tax and international finance are developed	First				MOEE, MOPF	MOI, private sector, international agencies
Develop guidelines for including energy efficiency and low-carbon development priorities within the Environmental Management Fund (EMF).	Energy efficiency and low-carbon development integrated within the EMF	Second				MOEE, MONREC, MOI	MOI, MOPF, development partners, private sector, IFIs
Disburse climate change finance for low-carbon and resource-efficient technologies, namely for renewable energy technologies.	Improved public and private sector access to climate finance for low-carbon and resource-efficient technologies, namely, renewable energy technologies such as hydropower (as designated in Myanmar's NDC)	First				MOEE, MONREC, MOI	MOPF, development partners, private sector, IFIs
Allocate revenue from natural resource extraction to a climate change fund, such as the EMF.	Increased allocation to the climate change fund in question (such as the EMF)	First				MOEE	MONREC, MOALI, MOI, private sector, international agencies
Seek international development partners to integrate the road network and implement plans to improve the supply chain of agricultural products.	Farmers have increased access to markets and generate more income	First					

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 4: Increase Access to Climate-Resilient and Low-Carbon Technologies and Practices in the Energy, Transport, and Industry Sectors

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Introduce and promote innovative technology for renewable energy—for example, solar, wind, tidal, and wave)—in the energy, transport, and industry sectors.	Improved access to innovative technology for renewable energy from sustainable sources in the energy, transport, and industry sectors	Second				MOEE	MOI, MOE, MOALI, private sector, CSOs
Provide training and exposure to stakeholders on improved technology for energy and waste management to reduce GHG emissions and promote environmental sustainability.	Stakeholders trained on energy and waste management technologies	Second				MOI, CDCs	MONREC, MOEE, private sector
Identify and promote energy-efficient and climate-friendly technologies and practices—such as improved cooking stoves, off- and mini-grid energy, and access to biomass—with a gender-sensitive approach.	Energy-efficient technologies and practices promoted	First				MONREC, MOEE, MOALI, MOI	MOEE, international agencies
Promote low-emission technologies, such as renewable energy, targeting the energy and industry sectors.	Low-emission and renewable energy technologies promoted	Third				MOI, MOPF	MOEE, MONREC, private sector, international agencies

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 5: To Enhance Awareness and Capacity to Promote and Implement Climate-Resilient and Low-Carbon Responses

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Carry out studies looking at climate change impact and implications in the energy, industry, and transport sectors.	Climate change impact studies carried out	First				MOEE	MOI, MOTC, MONREC, MOE, ARIs
Carry out risk assessment of public infrastructure and develop risk reduction and mitigation plans.	Risk assessment of public infrastructure carried out	First				CDCs, MOC	MOEE, MONREC, private sector, international agencies
Prepare training guidelines and module on energy efficiency and low-carbon development of the energy sector.	Training guidelines and module developed	Third				MOEE, MOI, MOALI	PS, MOTC, MONREC, development partners, international agencies
Provide training to government and private sector stakeholders on climate proofing and screening guidelines and methods.	Capacity of the government and private sector on climate proofing and screening developed	Second				CDCs, MOC	MOEE, MONREC, private sector, international agencies
Establish weather and climate information services in cities and towns, including rural areas.	Weather and climate information services established	Second				MOIN, CDCs, MOC	MOTC, (DMH), MOHA (GAD), MOSWRR, MOIN

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 6: **To Promote Multi-Stakeholder Partnerships to Support and Scale Up Climate-Resilient and Low-Carbon Responses**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop public–private partnership (PPP) procedures and guidelines for private sector investment in low-carbon energy production and consumption in the industrial, construction, and mining sectors, amongst others.	Institutional mechanism and partnership modality developed	First				MOEE, MOI	PS, MOPF, IFIs
Establish linkages and collaboration between local government (CDCs) and international and national actors to increase the number of buses, trains, and cars that use low-emission technologies.	Increased collaboration between local governments, the private sector, and other agencies	Second				MOEE, MOI	MOPF, MONREC, private sector, development partners, MOALI
Develop regulations to promote tax exemptions, loans, and grants as incentives for clean energy investment for private sector and international cooperation.	Regulations to promote tax exemptions, loans, and grants developed	Third				MOEE, MOI	PS, MOPF, IFIs

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

9.4 Resilient, Inclusive, and Sustainable Cities and Towns Where People Can Live and Thrive

9.4.1 | Sectoral Outcome

The sectoral outcome is that all township and city dwellers, including the most vulnerable, are safe from increased risks of rapid- and slow-onset natural disasters and live in sustainable, inclusive, low-carbon, and climate-resilient towns.

Table 9.4: Expected Results and Indicators

Sectoral Expected Results	Strategic Indicators
Town and city residents have access to resilient infrastructure and services that protect them from natural hazards of increased intensity, continue to perform during and after shocks, and are best adapted to the new climatic context.	• Number of local and national spatial and land-use planning frameworks that include climate change considerations from a low baseline • Number of laws, policies, and by-laws for urban management and development that include climate change, from a low baseline • Number of new, converted, retrofitted infrastructure, basic services, and buildings that are climate change responsive, from a low baseline • Number of town planners, architects, and engineers who can help townships and cities plan and manage climate change considerations from a low baseline • Number of township and city climate change action plans based on ecosystem adaptation or other approaches that support the development of green cities • Number of real estate developers and private industries who integrate climate change in their development projects
Climate change resilience, low-carbon development, and social inclusivity approaches are defining elements of urban planning and development, providing mitigation and adaptation co-benefits.	
New buildings are designed and constructed to be energy- and resource-efficient and resilient to natural hazards and disasters; they emit less carbon and produce savings from reduced energy consumption, thus providing equity and affordability.	

Source: MNREC, 2018.

9.4.2 | Objectives for Action Areas

The objectives for the action areas are as follows:

(i) Ensure that legal, policy, and normative instruments for urban development and management integrate climate adaptation and DRR.
(ii) Build climate change-responsive institutional and decentralised processes in urban settings.
(iii) Increase the human resource capacities and awareness of CDCs and townships to address climate change.
(iv) Build financial capacities for addressing climate change at the local level, using multiple sources of funding.
(v) Increase access to technology for urban climate resilience.
(vi) Promote public–private and civil society partnerships at the town and city levels for climate change resilience and sustainable urban development.

9.4.3 | Key Actors

The focal agency is the Ministry of Construction (MOC) (Department of Urban and Housing Development), and the lead actors are the MOC (Department of Urban and Housing Development), CDCs, and townships.

Other actors include the following: (i) the MOHA (GAD); (ii) MOEE; (iii) MOTC; (iv) MONREC; (v) Relief and Resettlement Department (RRD); (vi) National Committee for Environmental Conservation and Climate Change; (vii) State and Regional Committees for Environmental Conservation and Climate Change; (viii) CDCs, including (a) the Mandalay City Development Committee, (b) Yangon City Development Committee, and (c) Nay Pyi Taw Development Committee; (ix) township development committees; (x) the UN (UN-Habitat, UNEP, and UN Industrial Development Organization); (xi) development partners; (xii) local government (regional, district, and township); (xiii) NGOs; (xiv) CSOs; (xv) CBOs, including local ward and neighbourhood groups; (xvi) international technical experts (ITEs); (xvii) international technical support (ITS); (xviii) the private sector, including the Union of Myanmar Federation of Chambers of Commerce and Industry and other business associations; and (xix) the Myanmar Engineering Society.

9.4.4 | Climate-Resilient, Inclusive, and Sustainable Towns and Cities Where People Can Live and Thrive

Objective for Action Area 1: Integrate Climate Adaptation and Disaster Risk Reduction into Urban Development and Management Legal, Policy, Normative, and Planning Instruments

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible institution	
			S	M	L	Lead	Support
Mainstream climate change adaptation and mitigation into the legal and policy framework for urban development and management.	All main urbanisation policies—the National Urban Policy, Housing Framework, and National Spatial Development Framework—include climate change	First				MOC	CDCs, MOHA (GAD)

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Objective for Action Area 1: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible institution	
			S	M	L	Lead	Support
Develop by-laws at the township and city levels that incentivise low-carbon development and require climate-resilient development.	By-laws in place for every township	Third				CDCs	MOE, MOEE, private sector
Integrate energy efficiency, environmental considerations, and disaster resilience into building regulations.	Existing building regulations reviewed for opportunities to integrate energy efficiency and disaster resilience Myanmar National Building Code adopted within 1 year, integrating energy and water supply efficiency provisions, green buildings, and hazard-sensitive construction EIAs applied systematically as needed	Third				MOC	CDCs, MOHA (GAD)
Develop climate change and disaster risk management action plans at the urban and local levels by incorporating lessons learned from the previous disaster, particularly Cyclone Nargis (2008).	Existing plans reviewed and gaps to be addressed by climate change and disaster risk management plans identified Climate change adaptation, mitigation, and disaster risk management plans exist in each CDC Greater Yangon plan integrates climate change and disaster risk management	First				MOC	Local ward and neighbourhood groups, ITEs
Undertake climate risk assessments for essential public buildings and emergency services, and introduce new public disaster shelters in disaster-prone townships.	Risk assessment of public infrastructure carried out, and risk reduction and mitigation plans developed in main cities and towns and new public buildings in disaster-prone townships Training provided to government and private sector stakeholders on climate-proofing and screening guidelines and methods Climate-smart building codes and regulations reinforced	First				CDCs, MOC	MOE, MOEE, MONREC, private sector, international agencies

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 2: Build Climate Change-Responsive Institutional and Decentralised Processes in Urban Settings

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Strengthen urban institutional processes that promote sustainable transport.	Feasibility studies for urban public transport developed at the city level Urban public transport plans developed for implementation in collaboration with the private sector, and financing identified Public transport authorities established in urban areas to develop and implement mass transit systems	First			■	CDCs	MOC
Strengthen local governance ability to address climate change with focal points for climate change adaptation and resilience.	Local governance processes reviewed to assess roles in addressing climate change Townships and CDCs have nominated focal points for climate change	Third	■			MOHA (GAD), CDCs	MOC, ITEs

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 3: Increase Human Resource Capacities and Awareness of City Development Committees and Townships to Address Climate Change

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Improve urban authorities' capacity to use basic technology for data collection, data management, and geographic information systems (GIS) in preparing for disasters.	Assessment of capacity gaps carried out and action plan developed Local authorities access and receive training on skills to use a number of tools E-governance system reactivated to promote GIS mapping and other good practices	Second		■		MONREC (ECD, DOF) DMH, RRD, MOC, MOHA, CDCs	CDCs, international agencies, ITS
Strengthen capacity of local government officials to assess vulnerability and plan for climate change adaptation by highlighting the lessons from previous climate disasters.	Training on assessing vulnerabilities, climate change impacts, and adaptive measures provided for staff, especially in the most vulnerable townships	First	■			MONREC (ECD, Forest Department, DMH), RRD, MOC, MOHA, CDCs	CDCs, international agencies, ITS

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Objective for Action Area 3: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Increase sectoral capacity for effective liquid and solid waste management.	Existing systems reviewed and action plan for improvement and scale up devised Financing for water and solid waste management systems identified, including for planned urban expansion Adequate liquid and solid waste management systems to service the urban population	Third			■	CDCs, utility companies	MOC, private sector
Increase town planning capacities to integrate climate change into spatial strategic urban and land-use planning.	National town planners lead CDCs' strategic urban plans and land-use plans integrating climate change Training provided to government and private sector stakeholders on climate-proofing and screening guidelines and methods	Second			■	ECD, Forest Department, DMH, RRD, MOC, MOHA, CDCs	CDCs, international agencies, ITS
Revise existing educational curricula to include climate change (particularly for engineering and architecture students at the university level).	Existing curricula reviewed to identify entry points for including climate change University and technical institute curricula for engineering, architecture, and planning integrate climate change and DRR techniques New curricula developed and rolled out to engineering and architecture courses	First	■			MOE, MOC	Universities, international agencies
Implement campaigns to raise community awareness of the likely impacts of climate change and basic DRR techniques by incorporating lessons learned from previous climate-induced disasters.	Training provided to heads of 100 households to capacitate them to provide ongoing information on DRR measures to their own communities	Second	■			CDCs, NGOs	CSOs, private sector, neighbourhood wards

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 4: Build Financial Capacities to Address Climate Change at the Local Level, Using Multiple Sources of Funding

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Increase budgeting at the local level for climate change adaptation and mitigation.	Feasibility studies for township-level budgeting for climate change adaptation and mitigation carried out; financing plans for townships developed Agreed percentage of CDCs' annual budget allocated to climate change activities	First				CDCs	MOC
Increase the capacity of local authorities to access additional sources of funding, including national and international climate financing.	CDCs and townships access national and international finance for local resilience initiatives	Third				CDCs	Private sector, international agencies, international climate funds

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 5: Increase Access to Technology for Urban Climate Resilience

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Assess technology gaps for addressing and monitoring climate change adaptation and mitigation, including disaster-resilient buildings and technologies such as urban ecosystem-based adaptation interventions and nature-based solution for green cities.	Assessment of technology gaps carried out and action plan developed Local authorities trained, supported, and capacitated to understand measures and technologies to employ for adaptation and mitigation	Second				CDCs	MOC
Pilot cost-effective adaptation and mitigation technologies that also promote green cities in line with Myanmar's plan for greening cities.	Local authorities have knowledge of cost-effective green technologies and access to an evidence base on how they can contribute to climate action	Third				CDCs	MOC; ECD

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 6: Promote Public–Private and Civil Society Partnerships at the Town and City Levels for Climate Change Resilience and Sustainable Urban Development

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Establish multi-stakeholder partnerships and participation and debate mechanisms in local climate action at the township level.	Functioning multi-stakeholder groups exist at the township level engaging on climate change impacts, adaptation, and sustainability, promoting low-carbon and sustainable investments	First				GAD, RRD, DMH, CDCs, private sector, CBOs, NGOs	NGOs, CSOs
Establish PPPs to encourage investments in climate-resilient infrastructure, low-carbon developments through zoning, planning, and incentive mechanisms.	Private sector sensitised through forums and business cases Procedures in place for private sector projects to follow building regulations and codes and invest in energy- and water-efficient systems, low-carbon construction, and urban industrial and commercial ventures	First				Private sector, MOC, ECD, CDCs	CDCs, MOHA, MONREC

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

9.5 Climate Risk Management for People's Health and Wellbeing

9.5.1 | Sectoral Outcome

The sectoral outcome is that communities and economic sectors are able to respond to and recover from climate-induced disasters, risks, and health impacts and build a healthy society.

9.5.2 | Objectives for Action Areas

The objectives for the action areas are as follows:

(i) Ensure that legal, policy, and normative instruments on DRR, social protection, and health integrate climate adaptation and DRR.

Table 9.5: Expected Results and Indicators

Sectoral Expected Results	Strategic Indicators
Climate risk management system is well established, robust, and nationally integrated to respond effectively to the increased intensity and impact of risks and hazards on people's health and wellbeing.	• Number of climate risk management systems developed, including risk-informed policy development and planning guidelines, tools, and framework • Number of local communities, local government, and CSOs with access to risk mapping, early warning systems, and disaster-resilient technologies for disaster preparedness and emergency management and response
Myanmar has improved social protection, gender consideration, and risk finance capacity to prepare for and recover from potential loss and damage resulting from climate change.	• Number of states and townships with capacity for climate risk management planning • Number of social protection policies, strategies, budgeting, and plans that integrate climate change • Number of private sector companies, development partners, government bodies, CSOs, and international communities who allocate a share of resources to social protection and resilience-building activities
Myanmar's health system is improved and can deal with climate-induced health hazards and support climate-vulnerable communities to respond effectively to disaster and health hazards from climate change.	• Number of states and townships that integrate climate change in their budgeting system to finance climate risk management and social protection activities at the national and subnational levels • Number of laws, by-laws, policies, and plans within the health sector that integrate climate change • Number of health professionals and government staff with capacity for climate risk and disaster mapping, early health hazard detection, and forecasting and resilience planning • Number of households in climate-vulnerable states or regions and townships with access to improved health and sanitation practices and resilient health infrastructures

Source: MNREC, 2018.

(ii) Build climate change-responsive institutional and decentralised settings.

(iii) Increase human resource capacities and awareness of communities, governments, the private sector, and CSOs to address climate-induced risk and disasters.

(iv) Build financial capacities for addressing climate change at the local level, using multiple sources.

(v) Increase access to technology for climate risk management and improved health and wellbeing.

(vi) Promote public–private and civil society partnerships at the national and subnational levels for climate change resilience and sustainability.

9.5.3 | Actors

The lead actors are (i) the MOSWRR; (ii) MOTC (DMH); and (iii) MOHS (Department of Public Health).

Other actors are as follows: the National Disaster Management Committee and its members; MOHA (the police, GAD, and fire service); MONREC (ECD, Remote Sensing and GIS Survey Department); MOALI (IWUMD); MOPF; MOC; MOIN; MOE; local government (state, district, township); representatives from line ministries with DRR and climate change-adaptation activities; the DRR Working Group; the UN (UNDP, FAO, UN-Habitat, UN International Children's Emergency Fund, and UNEP); the Japan International Cooperation Agency; the Asian Development Bank; NGOs; international NGOs; CSOs; CBOs; the private sector; development partners; international agencies; the media; and universities.

9.5.4 | Climate Risk Management for People's Health and Wellbeing

Objective for Action Area 1: Integrate Climate Adaptation and Disaster Risk Reduction into Disaster Risk Reduction, Social Protection and Health, Legal, Policy, and Normative Instruments

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Review existing policies, strategies, and guidelines to identify gaps and scope for integrating climate change.	Review paper developed, looking into existing policies, strategies, and guidelines	First				MOSWRR, MOHS, MONREC	MOTC, MOALI, MOHA
Integrate climate change into DRR, social protection, gender equality, and health policies and plans for risk-informed policy development and planning.	DRR, social protection, and health policies and plans integrate climate change	First				MOSWRR, MOHS, MONREC	MOTC, MOALI, MOHA

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Objective for Action Area 1: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Provide support to townships or districts to develop and update disaster preparedness plans to include climate change risks and hazards.	Climate change integrated into local-level plans and responses	Second	■			MOSWRR, DMH	Local government, NGOs, CBOs, international agencies
Implement DRR and climate change adaptation activities and scale these up in vulnerable townships in the delta, Dry Zone, coastal, and mountainous regions.	DRR and climate change adaptation activities implemented in vulnerable townships	First			■	MOSWRR, DMH	Local government, NGOs, CBOs, international agencies
Update and implement multi-hazard preparedness and response plans to include climate-induced disasters.	Existing multi-hazard preparedness response plan updated to include climate change	First		■		National Disaster Management Committee, MOSWRR, MOALI, MOHS	GAD, local government, development partners, CSOs, CBOs
Implement activities to reduce climate-induced, water-related health hazards through increased access to safe drinking water, improved sanitation, and behaviour change communication.	Increased access to safe drinking water and improved sanitation for climate change-vulnerable households	First		■		MOHS	NGOs, CBOs, local government, development partners
Pilot social protection measures—such as social transfers, livelihood diversification, weather-indexed crop insurance, and access to credit and assets—in five vulnerable regions.	Social protection measures piloted	First	■			MOSWRR	MOPF, development partners, MONREC, MOALI, local government NGOs, private sector

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 2: Build Institutional and Decentralised Processes to Plan and Implement Climate Change Responses

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Strengthen disaster management committees for effective preparedness and response, including additional human resource development in the context of climate change.	Improved capacity of disaster management committees for integrating climate change	Third				MOSWRR, MONREC (ECD)	MOTC, MOHA (GAD), local government
Conduct health vulnerability assessment and develop health adaptation planning to address climate change impacts.	Up-to-date knowledge on key risks to the health sector	First				MOHS	
Carry out study to explore national, regional, and district linkages and potential mechanisms for climate risk management.	Study conducted	Third				MONREC, MOSWRR, MOTC (DMH)	MOHA, MOALI, local government, international agencies
Develop new institutional mechanism for effective early warning system and communication.	New institutional mechanism set up	Third				MONREC, MOSWRR, MOTC (DMH)	MOHA, MOALI, local government, international agencies
Strengthen the National Disaster Management Technical Centre in Hintada to provide technical support on climate-induced risk and climate change modules.	National Disaster Management Technical Center strengthened with climate change modules	First				MOSWRR	MONREC, MOTC, MOPF, MOHA

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 3: Build Financial Capacities to Address Climate Change at the Local Level, Using Multiple Sources of Funding

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Integrate climate change within national and subnational DRR planning and budgeting.	Climate change integrated in national and subnational DRR planning and budgeting systems	First				MOSWRR, MOPF	IFIs, MOTC, MONREC (ECD)
Provide training and exposure visits to build capacity of relevant institutions to improve financial management capacity to explore and manage funds for DRR and climate change adaptation.	Training and exposure visits organised for government officials	Third				MOSWRR, MOPF	International agencies, private sector, MONREC (ECD), MOTC (DMH), IFIs, CSOs
Mobilise a national contingency fund to support responses to climate risk and disasters.	National contingency fund mobilised to include climate change	First				MOSWRR, MOPF	IFIs, MOTC, MONREC (ECD)

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 4: Increase Access to Climate-Resilient and Low-Carbon Technology and Practices for Climate Risk Management and Health

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Provide training to government staff on ICT and other skill-based areas for effective climate change adaptation and DRR responses.	Number of trainings organised	Second				MOSWRR, MOTC (DMH)	International agencies, MOHS, MONREC (ECD), MOI, Union of Myanmar Federation of Chambers of Commerce and Industry

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Objective for Action Area 4: ***Continued***

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop early warning system that is accessible 24 hours a day to increase public access to weather and climate-related forecasts.	Early warning system strengthened	First	■			MOTC (DMH), MOSWRR, MOALI, MONREC	MOI, international agencies
Improve the efficiency of existing systems by modernising equipment, instruments, and tools (e.g. in ocean and marine contexts).	Improved quality of early detection and forecasts	Second	■			MOTC (DMH)	Union and state governments, CSOs, international agencies, MOHA
Set up water, air, and food assessment laboratory or facilities in the MOHS and in three major cities.	Water, air, and food assessment laboratory or facilities established	Third	■			MOHS, CDCs, MONREC (ECD)	International agencies
Retrofit and climate-proof critical infrastructure—including schools and hospitals—in climate-vulnerable townships.	Critical infrastructure retro-fitted and climate-proofed	Second		■		MOSWRR, MOPF	MOTC, international agencies, MOHS, MOC, local government, NGOs
Train government officials and development practitioners in scientific and technical skills, such as vulnerability assessment and risk and hazard mapping.	Government officials trained on vulnerability assessment and risk mapping	Second	■			MOTC (DMH)	MONREC, MOALI, MOSWRR, local government, development partners
Set up national and subnational-level (in delta, Dry Zone, coastal, flood, and mountainous regions) integrated surveillance systems for climate-sensitive diseases, with metrology data for an early health warning system.	Disease surveillance systems established	Third			■	MOHS departments	MOTC (DMH), development partners, CSOs

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 5: **Increase Awareness and Capacity of Relevant Ministries to Carry out Climate Risk Management Effectively**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Provide training to local communities on shelter management, and search and rescue in the context of climate change.	Communities trained on shelter management, and search and rescue	First				MOSWRR	MOC, local government, development partners, CBOs
Provide training and exposure to DMH staff for climate change research.	Training and exposure visit for DMH staff	Third				MOTC (DMH)	MONREC, MOHS, international and regional collaboration
Raise awareness of the health impacts of climate change, and provide training on mainstreaming climate change in health programming and planning.	Training and exposure visit for national and local government health officials	Third				MOHS	
Establish research grants for the DMH, sectoral agencies, and university students to build their capacity to generate knowledge and evidence that is useful for climate risk management.	Research grants established and made available	First				MOSWRR, MOTC	MOHA, development partners, NGOs, CBOs
Incorporate climate change and health modules in school, university, and training curricula.	Climate change and health modules available and integrated into school, university, and training curricula	Second				MOHS, MOE	MONREC

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 6: Promote Public–Private and Civil Society Partnerships at the National and Subnational Levels for Climate Change Resilience and Sustainability

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Form new or revitalise and upgrade existing district-, township-, state-, and national-level multi-stakeholder disaster risk management committees, integrating climate change within their portfolios.	Multi-stakeholder disaster risk management committees set up and strengthened at all levels	Second				MONREC (ECD), MOTC (DMH), MOSWRR	Local government, private sector, CSOs, development partners
Set up a network and DMH links with international and regional networks to exchange information and knowledge on climate and disaster forecasting.	Regional and international networks and links set up	Second				MOTC (DMH), MOSWRR	MOIN, MONREC, ECD, international agencies
Design and implement multi-stakeholder projects on climate risk management in climate-vulnerable areas.	Multi-stakeholders engaged in designing and implementing projects	First				MOSWRR, DMH	MOPF, MONREC, local government, development partners, private sector, CSOs
Develop multi-stakeholder, social-protection, and resilience-building projects for the Green Climate Fund and Adaptation Fund targeting the most vulnerable townships in Dry Zone, delta and coastal areas.	Projects for the Green Climate and Adaptation Funds developed	First				MOSWRR	MOPF, MONREC, MOHS, local government, private sector, CSOs, UN

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

9.6 Education, Science, and Technology for a Resilient Society

9.6.1 | Sectoral Outcome

The sectoral outcome is strengthened education, awareness, and technological systems that foster a climate-responsive society and human capital to design and implement climate-resilient and low-carbon development solutions for inclusive and sustainable development.

Table 9.6: Expected Results and Indicators

Sectoral Expected Results	Strategic Indicators
Capacity of actors in the education sector is developed to integrate principles of sustainability, low-carbon development, and resilience into the curricula at the primary, secondary, and tertiary levels.	• Number of policies, strategies, and action plans in the education, science, and technology sectors that integrate climate change • Number of primary, secondary, and higher-level institutions that integrate climate change in their curriculum, courses, and teaching materials • Number of university graduates and researchers trained and enabled to carry out independent and innovative work on climate change • Number of ICT materials—including research and extension products such as research papers, theses, policy papers, and technical working papers—that reflect climate change issues and solutions • Number of university professors, lecturers, schoolteachers, and university graduates who can help the government and private sector consider climate change in their planning and management • Number of households in climate-vulnerable states and townships that are aware of the consequences of climate change and can identify response measures • Increase in the share of climate financing for information, knowledge, research, and capacity building from the government, development agencies, international organisations, and other sources • Number of networks and partnerships amongst different actors set up to promote climate-responsive education, science, and technology • Number of joint collaborative projects to strengthen education, science, and technology to promote climate resilience and low-carbon development strategies and actions at the national and subnational levels.
Capacity of actors in the science, technology, and education sectors is developed to generate research and build and use climate information systems.	
Institutional capacity and multi-stakeholder partnerships are enhanced to access and manage climate financing to ensure climate-responsive education, science, and technology.	

Source: MNREC, 2018.

9.6.2 | Objectives for Action Areas

The objectives for the action areas are as follows:

(i) Ensure that legal, policy, and normative instruments in education, science, and technology integrate climate adaptation and DRR.
(ii) Build climate change-responsive institutional and educational processes.
(iii) Increase human resource capacities on climate research and knowledge management and build climate change awareness in communities, governments, the private sector, and CSOs.
(iv) Build financial capacities for strengthening climate information services, using multiple sources.
(v) Increase access to climate information services, research, and technological innovations.
(vi) Promote multi-stakeholder partnerships at the international, national, and subnational levels for climate change education, science, and technology.

9.6.3 | Actors

The lead actor is the MOE, including the following departments: (i) Human Resource and Educational Planning; (ii) Department of Educational Research, Planning and Training; (iii) Basic Education; and (iv) Higher Education.

Other actors include the following: (i) the Department of Research and Innovation; (ii) MOIN (Department of Information, Department of Public Relations); (iii) MOSWRR (Department of Relief and Resettlement); (iv) MOPF; (v) MOALI; (vi) MOTC (DMH); (vii) MONREC (ECD); (viii) research institutes under different ministries; (ix) ARIs, including the Mandalay Technological University (Faculty of Bio-Technology), Yangon Technological University (University of Distance Education), Yangon University (Department of Geography), and University of Agriculture (University of Forestry); (x) local government (regional or state, district, and township); (xi) the UN (United Nations International Children's Emergency Fund, UN-Habitat, UNEP, and UNDP); (xii) the European Union; (xiii) CSOs; (xiv) the Climate Technology Centre Network, under the United Nations Framework Convention for Climate Change; (xv) the public and private sectors, including the media; and (xvi) social groups for youth, children, women, and other social groups.

9.6.4 | Education, Science, and Technology for a Resilient Society

Objective for Action Area 1: Integrate Climate Adaptation and Disaster Risk Reduction in Education, Science, and Technology Legal, Policy, and Normative Instruments

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop a new science and technology strategy that integrates climate change.	New strategy on science and technology developed	First				MOE	MONREC (ECD), international agencies
Revise the curricula and syllabi of all of the main universities and schools to integrate climate change.	New curricula developed integrating climate change	Second				MOE, ARIs	MONREC (ECD), MOPF
Integrate climate change in education sectoral planning systems at the national and local levels by developing guidelines and tools.	Climate change integrated in education sectoral planning systems	Second				MOE	MOPF, MONREC (ECD)

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 2: Build Climate Change-Responsive Institutional and Educational Processes

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Set up climate change coordination mechanisms in the education sector to establish better linkages and synergy.	Coordination mechanism set up	First				MOE, MOPF	MONREC (ECD), ARIs, development partners
Form new or revitalise existing organisations to mobilise women, youth, children, and vulnerable groups to ensure engagement on climate change.	Institutional mechanism formed or revitalised	Third				MOE	Other government agencies, local government, NGOs, donors
Develop strategies to strengthen the MOE's capacity to integrate climate change within institutional portfolios.	Strategy on developing the MOE's institutional capacity to manage climate change developed	Third				MOE	Other government agencies, local government, NGOs, donors

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 3: Build Financial Capacities to Strengthen Climate Information Services, Using Multiple Sources of Funding

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Set up a climate change research fund and develop guidelines to enhance education and research climate change.	Climate change research fund set up and guidelines developed	First	■			MOE, MONREC (ECD)	MOPF, international agencies
Finance projects on climate change-related education, capacity, and research.	Climate change-related projects implemented	First			■	MOE, MONREC (ECD)	Relevant ministries, international agencies
Develop and circulate budget guidelines for climate change integration in education, science, and technology.	Budget guidelines for climate change developed	Second	■			MOE, MOPF	MONREC (ECD), local government, CSOs

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 4: Increase Access to Climate Information Services, Research, and Technological Innovations

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Implement multi-disciplinary technology and research-focused projects on climate change.	Multidisciplinary technology and research projects on climate change implemented	First		■		MOE, ARIs	MOPF, MONREC (ECD), international agencies
Develop and promote a number of ICT events and materials to disseminate information on climate-resilient technology to youth, children, women, and other vulnerable social groups.	Improved ICT systems at the national and subnational levels	Second		■		MOIN	MONREC (ECD), MOC, DMH, international agencies

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 5: **Increase Capacities for Climate Research and Knowledge Management and Raise Climate Change Awareness in Communities, Government, the Private Sector, and Civil Society Organisations**

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Develop, package, and distribute public awareness-raising materials on climate change.	Public awareness-raising materials developed and provided to members of the public	Second				MOIN, MOE	MONREC, MOE, CSOs, media, private sector, local government
Provide training to all relevant ministries to raise awareness on how to integrate climate change resilience into programme and project cycles.	Capacity of ministerial staff on climate change enhanced	First				MOE	GAD, MONREC (ECD), international agencies
Conduct training courses for schoolteachers on climate change.	Schoolteachers sensitised on climate change	First				MOE MONREC (ECD)	NGOs, international agencies
Provide training on conducting on climate change research to ARIs and professionals.	Capacity of ARIs is strengthened	Third				MOE	GAD, MONREC (ECD), international agencies
Organise events to increase the media's awareness on climate change.	Training and awareness-raising activities for the media organised	Third				MOIN	MONREC (ECD), local government, state and private media, CSOs

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Objective for Action Area 6: Promote Multi-Stakeholder Partnerships for Climate Change Education, Science, and Technology at the International, National, and Subnational Levels

Strategic Policy Actions	Outputs	Priority	Timeframe			Responsible Institution	
			S	M	L	Lead	Support
Set up a climate change working group within the MOE to support climate change awareness, capacity building, and technology transfer.	Multi-stakeholder partnership modality and mechanism set up	First	■			MONREC, MOPF	Development partners, CSOs, private sector
Organise joint climate change science and technology fairs at the national and regional or state levels.	Climate change science and technology fairs organised	Third		■		MONREC, MOPF	MOPF, private sector, international agencies
Implement joint government–donor–CSO–private sector events on climate science, education, and technology, targeting vulnerable areas.	Joint collaborative project implemented	Third		■		MONREC, MOPF	Private sector, international agencies
Set up media and private sector networks for climate change information and knowledge exchange.	Networks amongst the media and private sector set up	First	■			MOIN	MOSWRR, MONREC, local government, media, private sector, NGOs, development partners

Note: S = short term (1–3 years); M = medium term (1–6 years); L = long term (1–12 years).

Acronyms

ARI	academic and research institutions
CBO	community-based organisation
CDC	city development committee
CFUG	community forestry user group
CSO	civil society organisation
DMH	Department of Meteorology and Hydrology
DOA	Department of Agriculture
DRR	disaster risk reduction
DZGD	Dry Zone Greening Department
ECD	Environment Conservation Department
EIA	environmental impact assessment
EMF	Environmental Management Fund
FAO	Food and Agriculture Organization
GAD	Department of General Administration
GCF	Green Climate Fund
GHG	greenhouse gas
GIS	geographic information system
ICT	information and communications technology
IFI	international financing institution
ITE	international technical expert
ITS	international technical support
IWUMD	Irrigation and Water Utilization Management Department
MCCA	Myanmar Climate Change Alliance
MOALI	Ministry of Agriculture, Livestock and Irrigation
MOC	Ministry of Construction
MOE	Ministry of Education
MOEE	Ministry of Electricity and Energy
MOHA	Ministry of Home Affairs
MOHS	Ministry of Health and Sports
MOHT	Ministry of Hotels and Tourism
MOI	Ministry of Industry
MOIN	Ministry of Information
MONREC	Ministry of Natural Resources and Environmental Conservation
MOPF	Ministry of Planning and Finance

MOSWRR	Ministry of Social Welfare, Relief and Resettlement
MOTC	Ministry of Transportation and Communication
NDC	nationally determined contribution
NECCCC	National Environmental Conservation and Climate Change Committee
NEMC	National Energy Management Committee
NGO	nongovernment organisation
NSDP	National Sustainable Development Plan
REDD+	reducing emissions from deforestation and forest degradation
RRD	Relief and Resettlement Department
SEA	strategic environmental assessment
SIA	social impact assessment
UN	United Nations
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UN-Habitat	United Nations Human Settlements Program

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