KINGDOM OF CAMBODIA

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CAMBODIA'S UPDATED NATIONALLY DETERMINED CONTRIBUTION

2020

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Foreword

The International community reached a truly historic milestone with the Paris climate agreement in 2015. Together, we agreed to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels, to significantly reduce the risks and impacts of climate change.

Cambodia has always been a strong supporter of multilateral action on climate change. As a country particularly vulnerable to the impacts of climate change, we understand the urgency of ambitious climate action and aim to lead by example, in line with our capacities and responsibilities under the United Nations Framework Convention on Climate Change (UNFCCC).

The updated Nationally Determined Contribution (NDC) for Cambodia presents our commitments and needs for the next decade, in order to realize our vision of a low carbon and resilient society. Developed through extensive consultations over a nine-month period, our NDC includes contributions from all concerned stakeholders in the country, including relevant ministries and agencies, civil society representatives, development partners, academia, and the private sector.

The updated NDC has been improved in several important ways. First, coverage has increased to include climate change mitigation targets in the agricultural and waste sectors, and also with more detailed actions in key sub-sectors, such as energy efficiency. It includes a stronger set of adaptation actions, which remain the top priority for Cambodia. Second, we have set an ambitious target in the Forestry and Land Use sector (FOLU) for halving the deforestation rate by 2030, in line with our REDD+ strategy. In other sectors, we have increased our level of ambition for Green House Gases (GHG) emissions reduction compared to our initial NDC in 2015. Third, the updated NDC pays particular attention to gender and vulnerable groups, in order to ensure that our adaptation and mitigation actions contribute to a more inclusive society. Finally, a significant effort has been made to develop a solid framework for measurement, reporting and verification (MRV), so that we are able generate credible evidence on progress made and on challenges encountered. This will help us to keep refining our

policies so that we not only meet our NDC commitments, but also our climate change targets under the Sustainable Development Goals (SDGs).

I would like to take this opportunity to thank all our partners who have contributed to the development of this document, both at the sectoral and national levels. I would like to thank in particular the Cambodia Climate Change Alliance programme (funded by the European Union, Sweden, and UNDP), the World Bank, the NDC Partnership, and other Development Partners for their support and cooperation for this process.

As Cambodia is committed to doing her part to address the global challenge of climate change, we look forward to working with all our partners to address our remaining needs in financing, capacity development, and technology transfers. This cooperation and support will be crucial to achieve the ambitious vision set out in this document.

Say Samal
Minister of Environment
Chair of the National Council for Sustainable Development

Acronyms

ADB	Asian Development Bank
AI	Artificial Intelligence
BAU	Business as Usual
BUR	Biennial Update Report
CAMDI	Cambodia Disaster Loss and Damage Information System
CCAP	Climate Change Action Plan
CCCA	Cambodia Climate Change Alliance
CLUP	Commune Land Use Plan
CCCSP	Cambodia Climate Change Strategic Plan
CCTWG	Climate Change Technical Working Group
CDM	Clean Development Mechanism
CEDAW	Convention on Ending all Forms of Discrimination Against Women
CNCW	Cambodia National Council for Women
CO_2	Carbon Dioxide
COP	Conference of the Parties
CSDG	Cambodia's Sustainable Development Goals
DCC	Department of Climate Change
DLUP	District Land Use Plan
DRM	Disaster Risk Management
EMIS	Education Management Information System
EMS	Environmental Management System
ESS	Environmental and Social Safeguards
ETF	Enhanced Transparency Framework
EWS	Early Warning Systems
EX-ACT Tool	EX-Ante Carbon Balance Tool
FAO	Food and Agriculture Organisation
FOLU	Forestry and other Land Use
GSSD	General Secretariat of the National Council for Sustainable Development
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GHG	Greenhouse Gases
IPCC	International Panel on Climate Change
JCM	Joint Crediting Mechanism
LGCC3	Local Government and Climate Change III
M&E	Monitoring and Evaluation
MAFF	Ministry of Agriculture, Forestry and Fisheries
M&E	Monitoring and Evaluation
MEF	Ministry of Economy and Finance
MIS	Management Information System
MISTI	Ministry of Industry, Science, Technology and Innovation
MME	Ministry of Mines and Energy
MLMUPC	Ministry of Land Management Urban Planning and Construction
MoE	Ministry of Environment
MoEYS	Ministry of Education Youth and Sports
MoH	Ministry of Health

MoINF	Ministry of Information
MoP	Ministry of Planning
MoWA	Ministry of Women's Affairs
MoWRAM	Ministry of Water Resources and Meteorology
MoT	Ministry of Tourism
MPWT	Ministry of Public Works and Transport
MRD	Ministry of Rural Development
MRV	Measurement Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NAP	National Adaptation Plan
NAPA	National Adaptation Plan of Actions
NCDD	National Committee for Sub-National Democratic Development
NCDM	National Committee for Disaster Management
NCSD	National Council for Sustainable Development
NDC	Nationally Determined Contribution
NGO	Non-Governmental Organisation
NSDP	National Strategic Development Plan
NSPGG	National Strategic Plan on Green Growth
ODA	Official Development Assistance
PPP	Public Private Partnerships
REDD	Reducing Emissions from Deforestation and Forest Degradation
RGC	Royal Government of Cambodia
RE	Renewable Energy
SDG	Sustainable Development Goals
SHS	Solar Home Systems
SMEs	Small and Medium Sized Enterprises
SNC	Second National Communication
TNA	Technology Needs Assessment
TNC	Third National Communication
UMIC	Upper Middle-Income Country
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
VDC	Village Development Committee
VER	Verified Emissions Reduction
WASH	Water Sanitation and Hygiene
WHO	World Health Organisation

Contents

Executive Summary

Chapter 1: Introduction

The International community reached a truly historic milestone with the Paris climate agreement in 2015. Together, we agreed to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels, to significantly reduce the risks and impacts of climate change.

The Royal Government of Cambodia (RGC) is committed to combating climate change and accelerating the transition to a climate-resilient, low-carbon sustainable mode of development. The RGC has supported global efforts against climate change by being a Party to the United Nations Framework Convention on Climate Change (UNFCCC) since 1996. Cambodia adopted and ratified the Paris Agreement by which the country submitted an ambitious Intended Nationally Determined Contribution (NDC), which showcased her progress in climate policy, and put forward mitigation targets and adaptation actions consistent with her national circumstances. The country is now proud to submit an updated NDC, which strengthens her aspirations towards a cleaner and greener economy and fulfils her obligations to better the lives of her citizens, in particular the vulnerable.

The focus of Cambodia's development is on reducing poverty and ensuring stable economic growth, with the aim of achieving upper-middle income status by 2030, as enshrined in the National Strategic Development Plan (NSDP). Cambodia is highly vulnerable to the effects of climate change, and adaptation features prominently in the NDC. At the same time, Cambodia's total greenhouse gas (GHG) emissions are increasing as the country develops. The country has already made remarkable progress in terms of climate change policy, particularly in mainstreaming climate change into national and sub-national planning. The RGC has developed and continues to implement the Cambodia Climate Change Strategic Plan 2014 – 2023 (CCCSP) (2013) and each relevant ministry has developed associated action plans (CCAPs). Cambodia's first Biennial Update Report (BUR) was submitted in August 2020, and the Third National Communication (TNC) work is underway. The National Monitoring and Evaluation (M&E) Framework for the response to Climate Change has also been developed and regular climate public expenditure reviews have been undertaken.

Cambodia has also improved the tracking of climate finance in her Official Development Assistance (ODA) database, among many other initiatives.

Chapter 2: Mitigation

This section contains an illustration of Cambodia's Business as Usual (BAU), the proposed mitigation targets and measures to support the achievement of them.

Business as Usual (BAU) emission scenarios

In the BAU scenario, overall GHG emissions in 2030 without the FOLU are expected to rise by up to 79 million tCO_2e/year, while overall GHG emissions with the FOLU are expected to increase to 155 million tCO_2e/year.

Sectoral share and absolute number of BAU GHG emissions in 2030

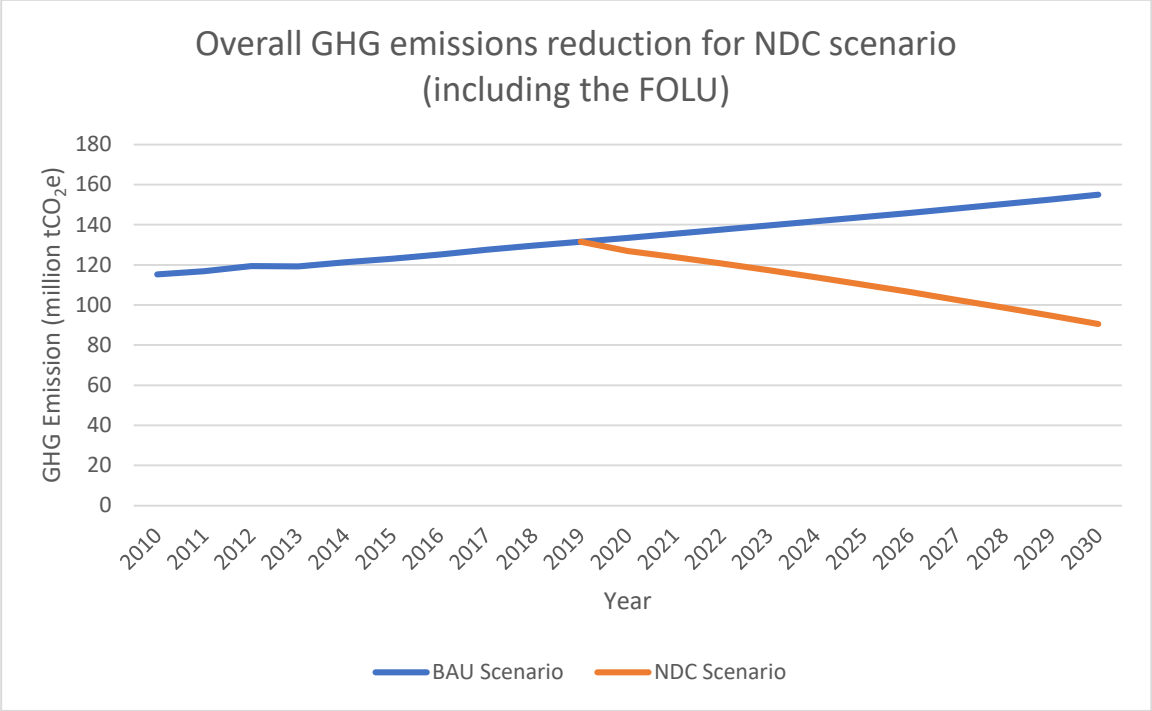
Sector	**Sectoral share (%)**	**GHG Emissions ($MtCO_2e$)**
FOLU	49.2	76.3
Energy	22.2	34.4
Agriculture	17.5	27.1
Industry (IPPU)	9.0	13.9
Waste	2.1	3.3

The FOLU sector will generate the highest overall BAU emissions in 2030, with 49.2% of the forecasted BAU emissions in 2030. This would be followed by the energy sector with 22.2%, the agricultural sector with 17.5%, and Industry (IPPU) with 9.0%.

Mitigation targets

Using the information provided by relevant ministries on the mitigation measures, activities and assumptions, NDC scenarios for energy generation, transport, waste, industry, agriculture, and the building sectors were modelled using PROSPECT+, while NDC scenarios for the FOLU sector were developed using the EX-ACT tool.

The estimated emission reductions of the NDC scenario are shown below.



Overall GHG emissions reduction (including the FOLU)

The estimated emissions reduction with the FOLU by 2030 under the NDC scenario will be approximately 64.6 million tCO_2e/year (41.7% reduction of which 59.1% is from the FOLU).

Summary over BAU emissions and NDC emissions reduction

Sector	BAU 2016 emissions ($MtCO_2e$)	BAU 2030 emissions ($MtCO_2e$)	NDC 2030 Scenario ($MtCO_2e$)	NDC 2030 reduction ($MtCO_2e$)	NDC 2030 emission reduction %
FOLU	76.3	76.3	38.2	-38.1	-50%
Energy	15.1	34.4	20.7	-13.7	-40%
Agriculture	21.2	27.1	20.9	-6.2	-23%
Industry (IPPU)	9.9	13.9	8.0	-5.9	-42%
Waste	2.7	3.3	2.7	-0.6	-18%
Total	125.2	155.0	90.5	-64.5	-42%

Mitigation measures

Mitigation actions were identified from information provided by the relevant ministries (MAFF, MISTI, MLMUPC, MME, MoE, MOEYs, MoT, MPWT, and NCDD) across seven mitigation sectors: energy, waste, industry, transport, agriculture, building, and the FOLU.

Chapter 3: Adaptation contribution

Adaptation features strongly in Cambodia's initial NDC and is equally important in this updated NDC due to the country's continued high vulnerability to climate change.

Cambodia's vulnerability to climate change

Based on several international climate change indices, Cambodia is considered one of the most vulnerable countries to the impacts of climate change. The country is particularly vulnerable to floods, droughts, windstorms, and seawater intrusion. Climate change may reduce the country's annual average GDP growth by 6.6% and absolute GDP by 0.4% in 2020, by 2.5% in 2030, and up to 9.8% in 2050. This may delay reaching upper middle-income status by one year. Accordingly, Cambodia has begun working to develop a National Adaptation Plan (NAP) based on the National Adaptation Programme of Actions (NAPA).

Impacts and priorities for adaptation and resilience

Cambodia's vulnerability is characterised by frequent floods and irregular rainfall, coupled with an agrarian based economy, limited human and financial resources, insufficient physical infrastructure, and limited access to technologies. Socio-economic status, location, access to resources and technologies all influence Cambodian's ability to manage climate impacts. Different social groups experience climate vulnerability differently, and women, children, the disabled, the elderly and other socially marginalised groups are often hit harder.

For the development of the SNC, climate change impacts and vulnerability were assessed for the most vulnerable sectors including agriculture and water resources, forestry, coastal zones, and human health.

Prioritised adaptation actions

As with mitigation, all Line Ministries with adaptation relevance submitted their proposed priority actions (86 in total). The focus sectors, in line with the vulnerability of the country, are:

- Agriculture (17 actions)
- Coastal zones (2 actions)
- Energy (2 actions)
- Human health (5 actions)

- Industry (1 action)
- Infrastructure – including roads, buildings and urban land use planning (15 actions)
- Livelihoods, poverty and biodiversity (7 actions)
- Tourism (3 actions)
- Water resources (6 actions).

In addition, a number of Ministries play an enabling role to facilitate the implementation of actions within the NDC. Such actions can be divided into:

- Education (4 actions)
- Gender (6 actions)
- Governance (2 actions)
- Information (4 actions)
- Knowledge sharing (1 action)
- Policy and planning (12 actions)

Chapter 4: Cross-cutting areas

The initial NDC was developed quickly which made conducting far-reaching consultations challenging. As such, some crucial areas of climate change policy and implementation were not adequately analysed, namely Gender; Youth involvement; and engagement with the Private sector.

Regarding Gender, all sectors, especially waste and energy, are key to mitigation. For adaptation, agriculture, forestry, and fisheries sectors are particularly important, and all ministries provided targets for women's participation. Gender-balanced training and awareness material and the promotion of 'women champions' are key. Most Ministries included gender disaggregated targets of each action across these areas.

Regarding youth involvement, in mitigation there is a focus on energy, industry and transport. In adaptation, youth are especially involved in energy, industry, and transport. Also, beyond direct engagement in these sectors, children and youth play a critical role in the development, implementation, monitoring, and enforcement of climate actions across sectors.

With regard to private sector engagement, Public-Private Partnerships (PPPs) are key to the industry, waste, and energy sectors. While the private sector is less prevalent than in

mitigation sectors, there are strong opportunities, especially for smallholder farmers and foresters. In general, the private sector can provide inputs, knowledge, and finance.

It is also important to highlight an additional area related to Indigenous People. The Cambodian Constitution recognises that all Khmer citizens (including all indigenous people under the National Policy on the Development of Indigenous Peoples) are equal before the law regardless of race, colour, national origin, etc. During the NDC implementation and particularly for mitigation measures in the FOLU, the RGC will seek to promote the rights of indigenous people, specifically concerning land ownership.

Chapter 5: Governance and Implementation Processes

The NDC update process

The Department of Climate Change (DCC) of the General Secretariat of the National Council for Sustainable Development (GSSD) led a preliminary assessment of the NDC implementation and the identification of gaps, as well as the development of the corresponding NDC Roadmap and Stakeholder Engagement Plan. This ensured that the country was able to review her NDC targets by the COP 26 meeting and is expected to achieve her stated contributions by 2030.

Summary of NDC implementation timeline and targets

	By 2020	By 2025	By 2030
Governance	Governance systems set up	NDC and climate change governance systems increasingly mainstreamed	NDC and other planning systems perfectly mainstreamed and used to report on NDC and SDGs
Mitigation	Implementation of mitigation actions	Increased ambition, economy-wide mitigation targets and implementation	Real-time economy-wide mitigation targets and implementation
Adaptation	NAP process ongoing and adaptation actions in NDC implemented	NDC linked to NAP process	NDC linked to NAP process and resilience improved
Finance	Finance systems set up and concessional financing terms	Climate investment plan operational and increased sophistication of finance system	Middle-income level of financial sophistication achieved
MRV/Transparency	Limited measurement of progress and development of transparency system	Transparency system partially operational	Transparency system upgraded and fully operational

Cambodia's Updated Nationally Determined Contribution (NDC)

The NDC update process was initiated with the relevant line ministries in March 2020 and included contributions from a number of development partner experts. A private sector event included the participation of stakeholders from a range of different sectors, and local communities and indigenous peoples were engaged in the process. Every effort was made to conduct consultations in a gender responsive way.

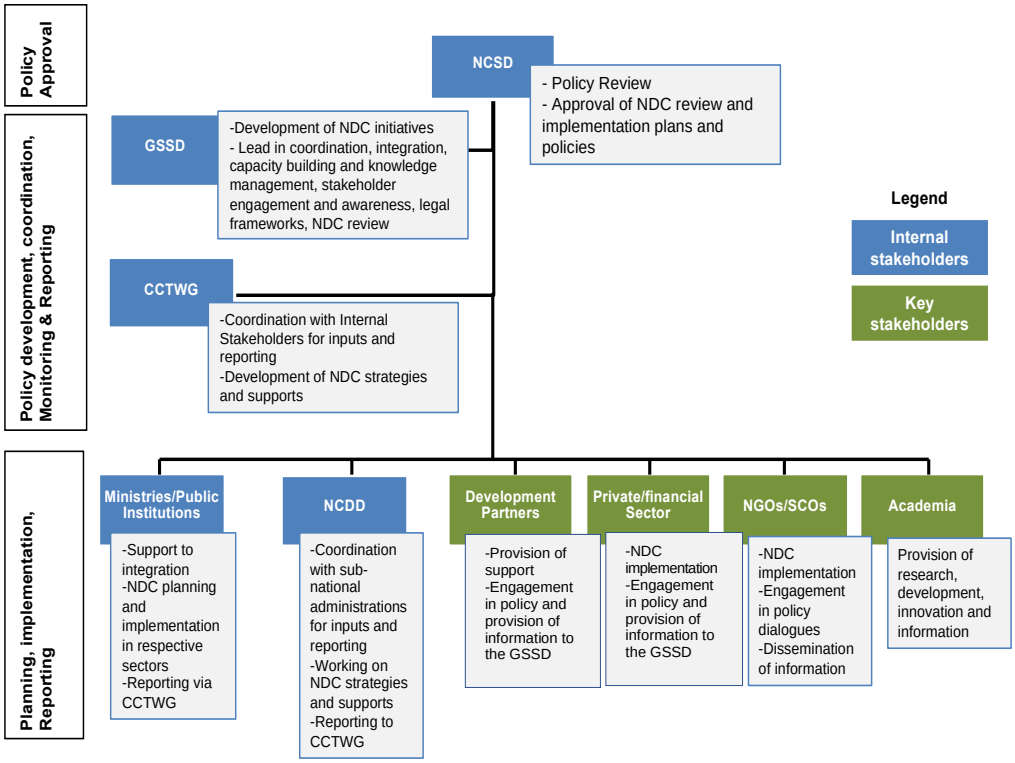
Overarching policy structures

Cambodia's NDC places strong focus on the CCCSP 2014-23 (2013) and the related Sectoral Action Plans for its implementation. The following guidelines are also crucial: Cambodia's Sustainable Development Goals (CSDGs) 2016-30 (2018); The National Strategic Plan on Green Growth (NSPGG) 2013-2030 (2013); The Rectangular Strategy IV (2018); The National Strategic Development Plan (NSDP) 2019-2023 (that is currently under development); The Circular Economy Strategy and Action Plan (also under development) sectoral policies; and the related strategies detailed in the Annex.

Stakeholder roles and responsibilities

An illustration of the roles and responsibilities of each stakeholder with regard to the NDC implementation is below.

Stakeholder roles and responsibilities



Chapter 6: Means of Implementation

This section presents an overview of the means of implementation across finance, capacity building, and technology.

Finance

Despite ongoing efforts, financial demands remain high. Future resource mobilisation will look towards a reasonable mix of national and international funds, in addition to market mechanisms, where appropriate, and in line with progress on Article 6 of the Paris Agreement. The total funding required for all mitigation actions is over US $ 5.8 billion. The FOLU, waste, and energy sector actions require the highest funding. Total funding required for all adaptation actions is just over US $ 2 billion. Infrastructure, water, and agriculture require the highest funding.

Barriers and capacity needs

The NDC review identified the need for capacity building for the NDC implementation, especially for the NCSD/DCC, CCTWG, and sectoral (and sub-national) TWGs. In addition, each ministry submitted its own capacity building needs, which will require a strong international support.

Technology needs and availability

Cambodia has developed a technology needs assessment for adaptation and mitigation, and technology needs also feature prominently in the sectoral climate change action plans. However, these are largely outdated so each ministry provided an action by action indication of technology needs and availability.

Chapter 7: Transparency

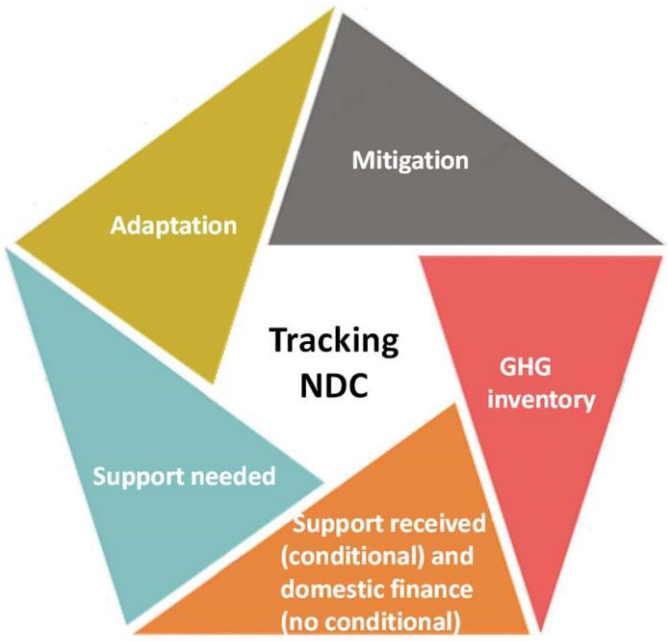
Overview

The RGC's approach to developing and operationalising its domestic measurement, reporting and verification (MRV) systems focuses on integration into the existing climate change M&E framework structure of the CCCSP rather than setting up new layers of institutional structures.

MRV for NDC Tracking

Cambodia is putting significant emphasis on the development of an integrated and detailed MRV system that is also aimed at achieving implementation of the NDC. It will be made up of the following components (mitigation, adaptation, GHG inventory, support received, and the support needed).

Components of MRV for NDC tracking



The system will detail how monitoring will occur and how data will be managed, aggregated, and translated into reports, with a particular focus on gender and vulnerable groups.
A simple, accessible online NDC tracking system will be developed and the tool will be made accessible through the website.

Information to facilitate clarity, transparency and understanding

The NDC contains a summary in table format of such information.

Fairness and ambition

Despite being a least developed country with an eighth of the per capita emissions when compared to the global average, with this NDC Cambodia is proposing an ambitious set of sectoral reduction targets and structured and comprehensive adaptation actions.

Chapter 8: Sustainable Development

Climate change mitigation and adaptation will be crucial not only to achieve SDG 13 on Climate Action, but a range of other SDGs and the Paris Agreement, given the cross-cutting nature of climate change. SDG 13 has significant implications on the achievement of other key priorities of each country, such as poverty reduction, food security, gender equality, water and sanitation, energy access, reduced inequalities, sustainable cities, and sustainable land use and ecosystems[1]. As part of the Cambodia NDC revision process, an analysis on how the NDCs can impact the achievement of the Sustainable Development Goals (SDGs) was carried out. Each mitigation measure and adaptation action has been screened against the attainment of the SDGs.

1 Source: CDKN (2019)

1 Introduction

1.1 Overview

The Royal Government of Cambodia (RGC) is committed to combating climate change and accelerating the transition to a climate-resilient, low-carbon sustainable mode of development. The RGC has supported global efforts against climate change by being a Party to the United Nations Framework Convention on Climate Change (UNFCCC) since 1996.

Cambodia adopted and ratified the Paris Agreement by which the country submitted an ambitious Intended Nationally Determined Contribution (NDC) which showcased progress in climate policy and put forward mitigation targets and adaptation actions consistent with the national circumstances.

The country is now proud to submit an updated NDC which strengthens her aspirations towards a cleaner and greener economy and fulfils her obligations to better the lives of her citizens, in particular the most vulnerable people.

1.2 National Circumstances

Cambodia's development focus is on poverty reduction and stable economic growth, to support the country's efforts to become an upper middle-income nation by 2030. To meet this aim, the National Strategic Development Plan (NSDP) prioritises: (1) investment in rural areas; (2) decentralisation of national governance; and (3) further integration into the ASEAN region and the wider international community.

Cambodia is highly vulnerable to the effects of climate change, and adaptation features prominently in the NDC. The sectors most affected are agriculture, infrastructure, forestry, human health, and coastal zone areas are particularly vulnerable to sea level rises and intrusion. According to the Global Climate Risk Index, Cambodia was ranked as the 12th most climate risk-prone country globally, showing the high-level of vulnerability to extreme weather events. However, beyond extreme weather events, climate change also results in slow-onset events that can have significant negative implications for Cambodia and her citizens, particularly the most vulnerable people. Climate change acts as a threat multiplier and its impacts are particularly damaging given the limited adaptive capacity of Cambodia's

population due to socioeconomic conditions such as poverty, malnutrition, agricultural dependence, settlements in flood-prone areas, and public health[2].

At the same time, Cambodia's total annual net greenhouse gas (GHG) emissions rising due to development activities. Hence, there is a need to prioritise developing Cambodia's economy and improving the socioeconomic wellbeing of its population, including the most vulnerable people, through low-carbon pathways.

Cambodia has already made remarkable progress in climate change policy, especially in mainstreaming climate change into national and sub-national planning. The Cambodian Government's coordinated strategy to tackle climate change is focused on adaptation, with a gradual increase in mitigation actions aligned with economic development goals. Cambodia has developed and continues to implement the Cambodia Climate Change Strategic Plan 2014 – 2023 (CCCSP) (2015) and each relevant ministry has developed associated action plans (CCAPs).

The country submitted her Intended NDC to the UNFCCC ahead of the Conference of Parties (COP) 21 in Paris in 2015 and then ratified the NDC in 2016. Cambodia's first Biennial Update Report (BUR) was also completed and submitted in August 2020 and the Third National Communication (TNC) work is underway. Further submissions of the NDCs will enable the Cambodian Government to progress in the fulfilment of the Paris Climate Agreement. The successful implementation of Cambodia's NDC will, however, rely on adequately accessing and mobilising domestic and international climate finance.

Cambodia has also made strong progress in developing and implementing monitoring and evaluation (M&E) frameworks, including for finance. The country has produced regular climate public expenditure reviews and has improved tracking of climate finance in her Official Development Assistance (ODA) database. The National M&E Framework for Climate Change Response has also been developed and future adaptation and mitigation efforts are anticipated to be supported by international donors and multilateral funds, as well as national contributions.

[2] Davies, G.I. et al (2015)

1.3 Outline of the Document

This document contains Cambodia's updated NDC, in alignment with the UNFCCC's decisions. Cambodia's INDC, submitted in 2015 and ratified in 2016, already contains mitigation targets and adaptation actions until 2030, so this document updates the initial submission.

Accordingly, the document is structured as follows:

- Section 2 contains the mitigation contribution,
- Section 3 illustrates the adaptation contribution,
- Section 4 includes cross-cutting areas of gender, youth involvement, and private sector engagement,
- Section 5 contains governance and implementation processes,
- Section 6 includes the means of implementation,
- Section 7 contains an illustration of transparency means across mitigation, adaptation, and finance, and
- In Section 8, the relationship between Cambodia's NDC and sustainable development is presented.

2 Mitigation Contribution

This section contains an illustration of Cambodia's Business as Usual (BAU), the proposed mitigation targets and measures to support the achievement of these targets.

2.1 Business as Usual emission scenarios

BAU scenarios were developed covering energy generation, transport, waste, industry, agriculture, building, and the forestry and other land use (FOLU) sectors. The BAU scenarios for electricity, transport, buildings, cement, other industries (excluding cement), agriculture, and waste sectors were developed using the PROSPECT+ model. The FOLU sector was formed based on the model developed for the REDD+ NDC assessment by the REDD+ Technical Secretariat (RTS).

Overall GHG emissions (including the FOLU) were validated using GHG emission values in the latest Biennial Update Report (BUR, 2020), which consists of GHG emissions from 2010 - 2016 for most of the sectors (except the FOLU). As shown in Table 1, the UNFCCC sectors were generated by combining certain PROSPECTS+ sectors.

Table 1 PROSPECTS+ Sectors conversion into the UNFCCC sectors

No	PROSPECTS+ Sector	UNFCCC sector
1	Electricity	Energy
2	Transport	
3	Buildings	
4	Other industry	Industry (IPPU)
5	Cement	
6	Waste	Waste
7	Agriculture	Agriculture[3]
8	FOLU	FOLU[3]

For each sector, a BAU scenario was developed by extrapolating past emission trends, interpolating available data, and using relevant influential factors (GDP, population, and the forestry growth rate) to fill in missing data in a sequence.

[3] We have kept Agriculture and the FOLU sectors separately in order to make the decision-making process easier for the government. However, we can merge it if needed and present as the AFOLU sector.

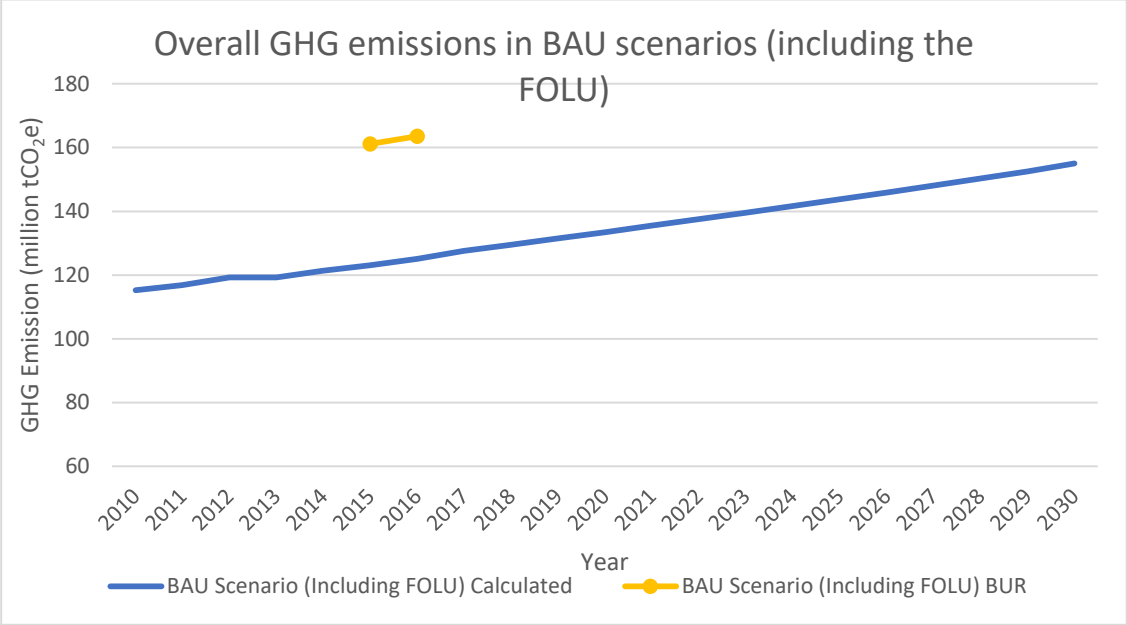


Figure 1 Overall GHG emissions in BAU scenarios (including the FOLU)

According to Figure 1, overall GHG emissions in 2030 without the FOLU would rise by up to 79 million tCO_2e/year, while overall GHG emissions with the FOLU are expected to increase to 155 million tCO_2e/year.

Figure 2 illustrates the forecast emissions for mitigation sectors under the BAU Scenario (including the FOLU Scenario) until 2030. The lower line (in grey) shows the BAU emissions of the waste sector, which has the lowest BAU emissions among all sectors, while most upper line (in green) shows the cumulative BAU emissions of all sectors.

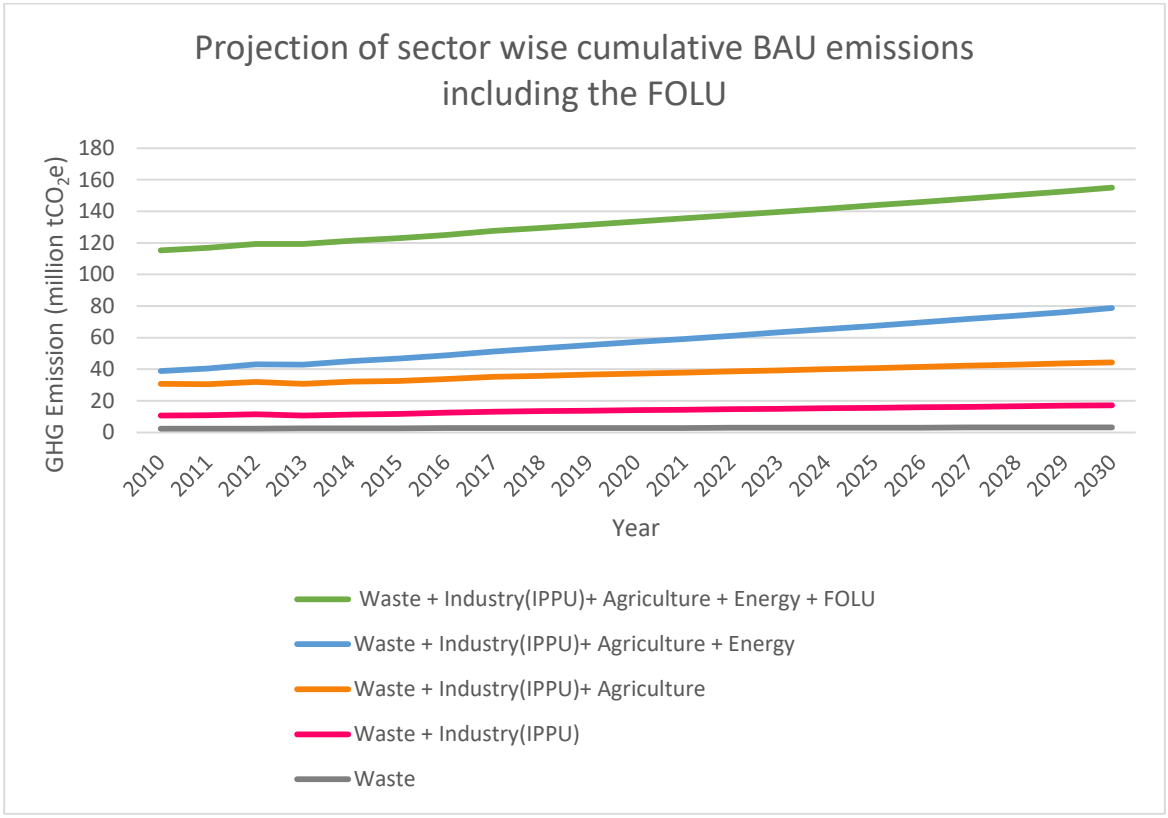


Figure 2 Projections of the BAU GHG emissions for all mitigation sectors

Figure 3 illustrates the forecast of emissions for each mitigation sector (excluding the FOLU) up to 2030.

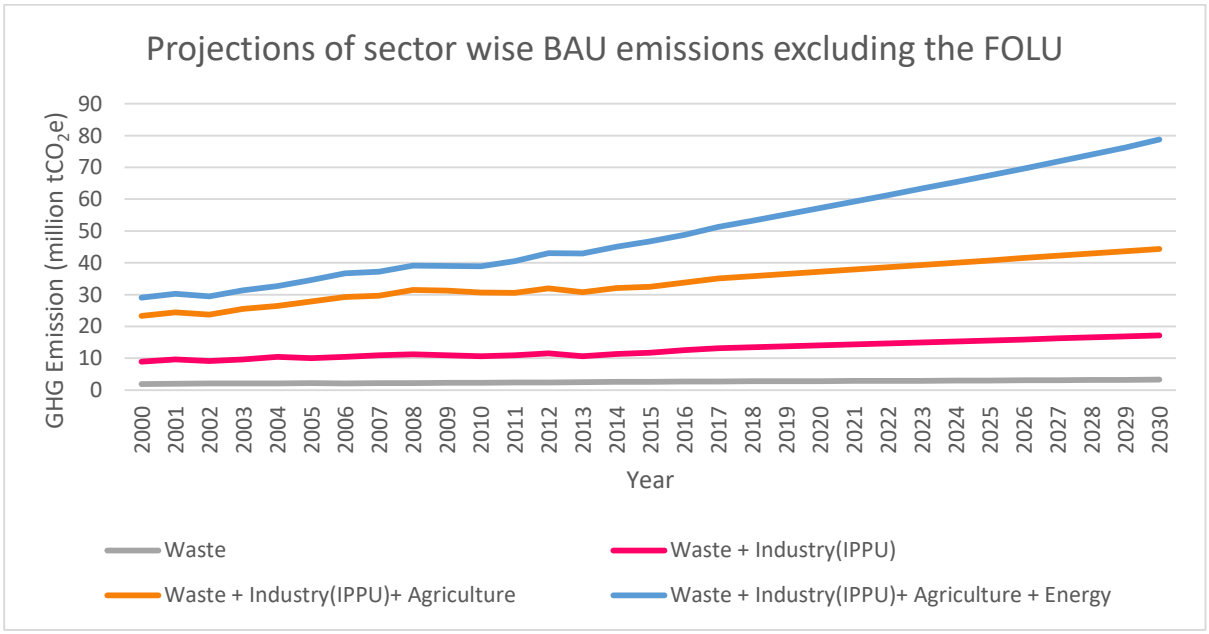


Figure 3 The BAU GHG emission projections for mitigation sectors (without the FOLU)

According to Figure 2 and Figure 3, the BAU scenarios for all sectors are steadily increasing. The highest emissions contributor is the FOLU sector, followed by the agricultural sector. The share of emission contributions of the sectors in 2016 and 2030 are illustrated in Figure 4, Figure 5, Figure 6, and Figure 7 below.

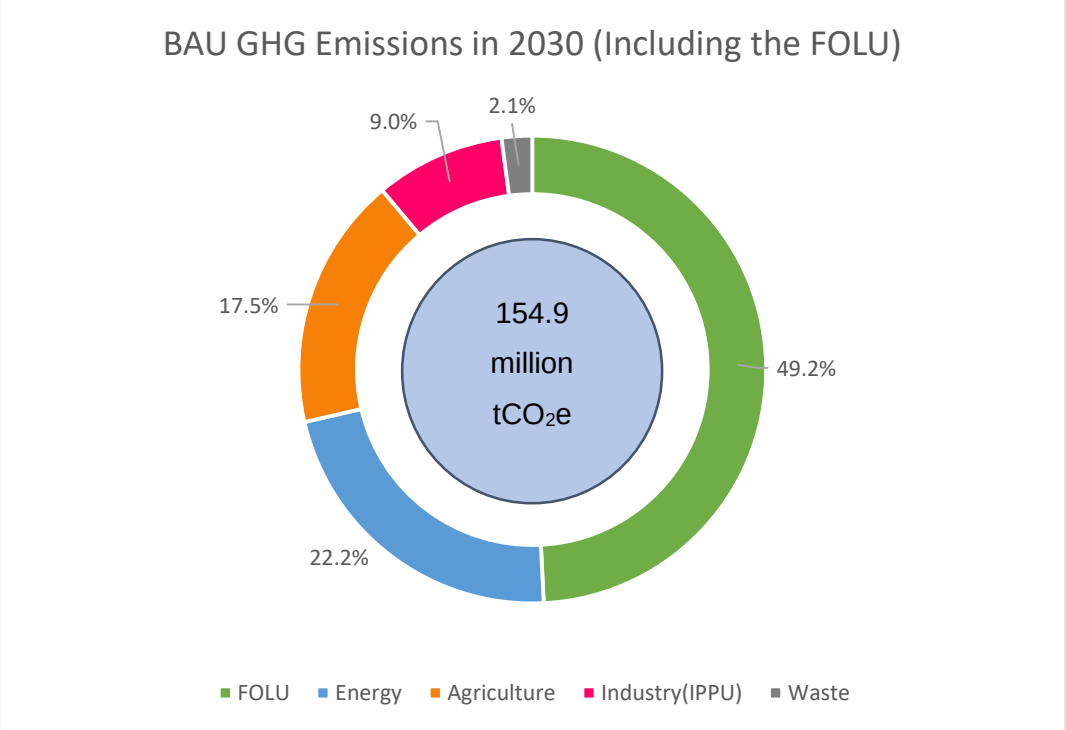


Figure 4 Sectoral share of the BAU GHG emissions in 2030

Table 2 Sectoral share and absolute number of the BAU GHG emissions in 2030

Sector	Sectoral share (%)	GHG Emissions ($MtCO_2e$)
FOLU	49.2	76.3
Energy	22.2	34.4
Agriculture	17.5	27.1
Industry (IPPU)	9.0	13.9
Waste	2.1	3.3
Total	**100%**	**154.9**

The FOLU sector would contribute the highest overall BAU emissions in 2030, contributing up to 49.2% of the BAU emissions. This would be followed by the energy sector with 22.2%, the agricultural sector with 17.5%, and industry (IPPU) with 9.0%. The FOLU, energy, agriculture, and industry (IPPU) sectors would be responsible for more than 95% of the estimated BAU emissions in 2030.

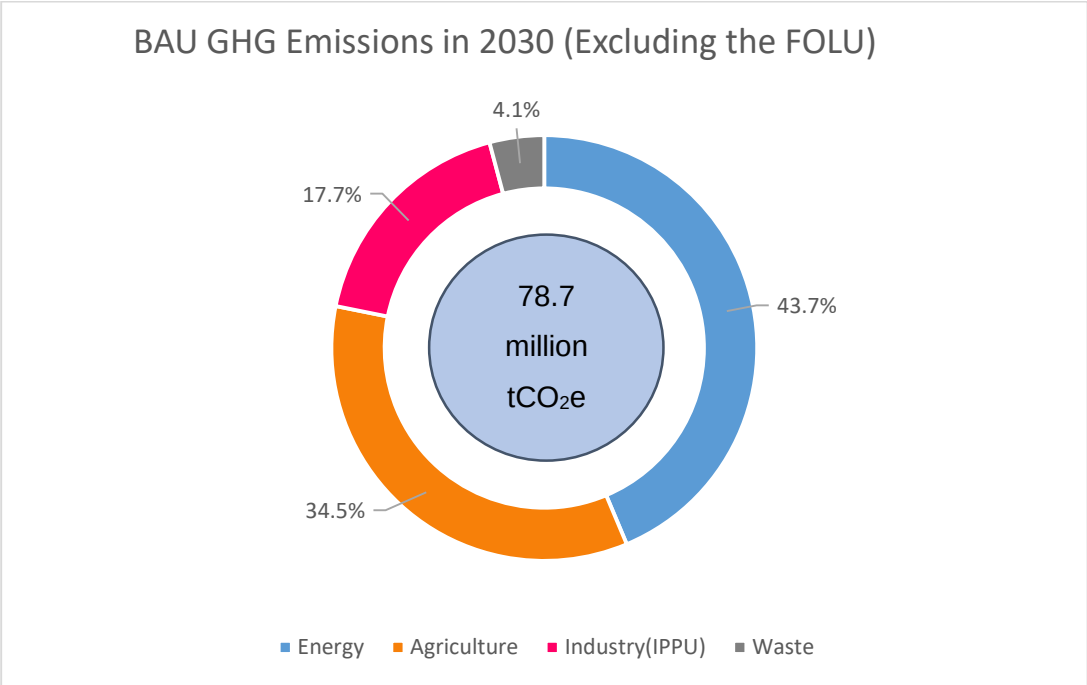


Figure 5 Sectoral share of the BAU GHG emissions in 2030

Table 3 Sectoral share and absolute number of BAU GHG emissions in 2030

Sector	Sectoral share (%)	GHG Emissions ($MtCO_2e$)
Energy	43.7	34.4
Agriculture	34.5	27.1
Industry (IPPU)	17.7	13.9
Waste	4.1	3.3
Total	**100%**	**78.7**

When considering the BAU emissions without the FOLU, the energy sector would contribute the highest overall BAU emissions in 2030. This would be followed by the agriculture sector with 34.5%, industry (IPPU) with 17.7%, and waste with 4.1%

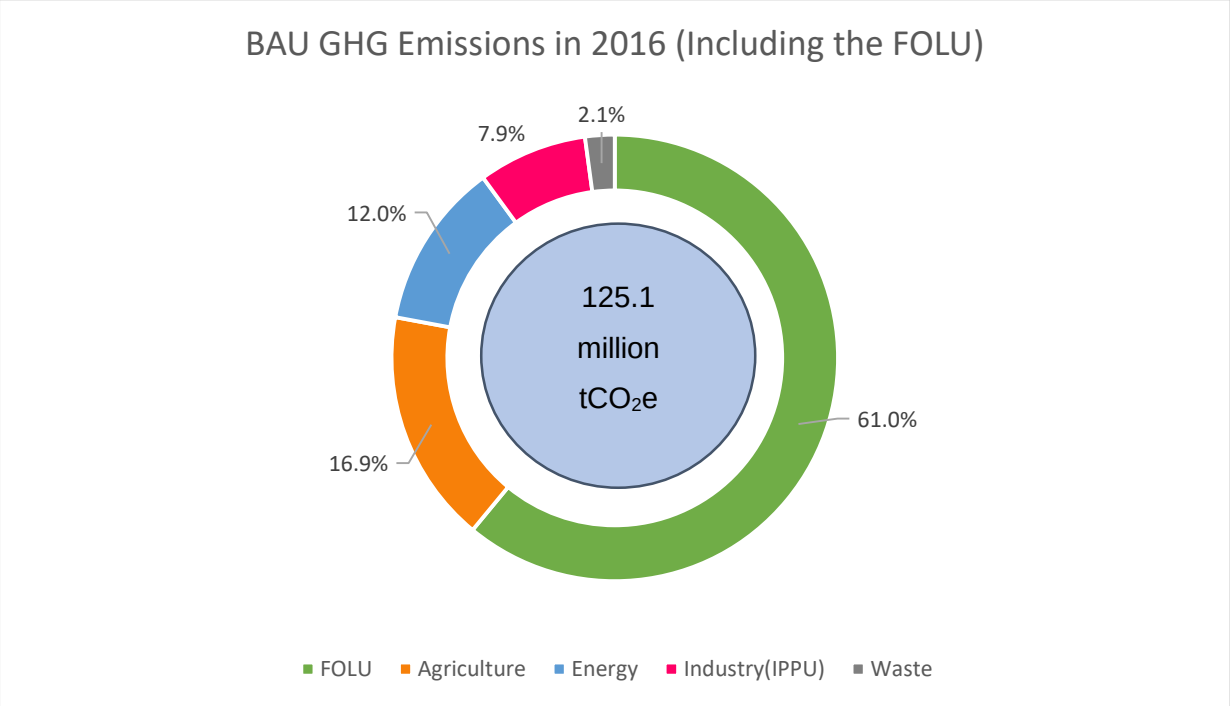


Figure 6 Sectoral share of the BAU GHG emissions in 2016

Table 4 Sectoral share and absolute number of BAU GHG emissions in 2016

Sector	**Sectoral share (%)**	**GHG Emissions ($MtCO_2e$)**
FOLU	61.0	76.3
Agriculture	16.9	21.2
Energy	12.0	15.1
Industry (IPPU)	7.9	9.9
Waste	2.1	2.7
Total	**100%**	**125.1**

The FOLU sector would contribute the highest overall BAU emissions in 2016 also, contributing up to 61% of the forecasted BAU emissions. This would be followed by the agricultural sector with 16.9%, the energy sector with 12%, and industry (IPPU) with 7.9%. The FOLU, agriculture, energy, and industry (IPPU) sectors were responsible for more than 95% of BAU emissions in 2016.

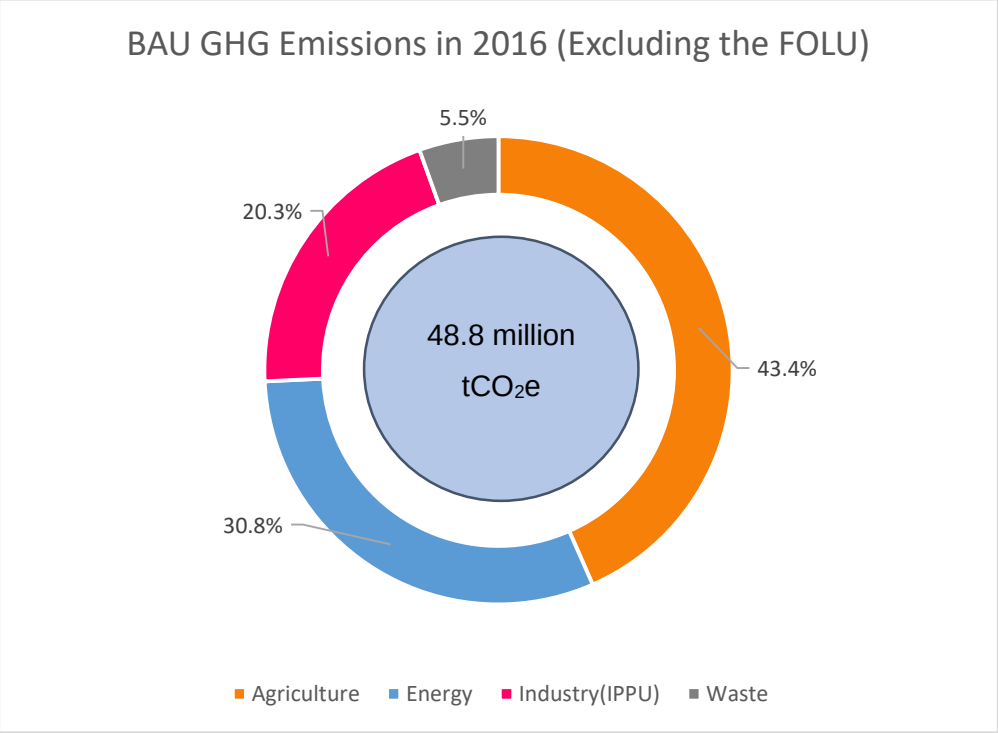


Figure 7 Sectoral share of the BAU GHG emissions in 2016

Table 5 Sectoral share and absolute number of BAU GHG emissions in 2016

Sector	Sectoral share (%)	GHG Emissions ($MtCO_2e$)
Agriculture	43.4	21.2
Energy	30.8	15.1
Industry (IPPU)	20.3	9.9
Waste	5.5	2.7
Total	100%	48.8

When considering the BAU emissions without the FOLU, the agricultural sector would contribute the highest overall BAU emissions in 2016. This would be followed by the energy sector with 30.8%, the industrial sector (IPPU) with 20.3%, and the waste sector with 5.5%.

2.2 Mitigation Targets

Using the information provided by relevant ministries on the mitigation measures, activities, and assumptions, NDC scenarios for energy, transport, waste, industry, agriculture, and the building sectors were modelled using PROSPECT+, while the NDC scenarios for the FOLU sector were developed using the EX-ACT tool.

The majority of targets identified below are conditional on the international support. Cambodia also implements mitigation actions under the country's sustainable development programme. The start and end year of each project were considered as 2020 and 2030, respectively.

Overall GHG emission reductions including the FOLU

NDC Scenarios

The FOLU NDC Scenario: Reduce 50% of historical emissions by 2030 (REDD+ programme); This target is based on the REDD+ national strategy which was included due to recommendations from the REDD+ Technical Secretariat (RTS) and the Department of Climate Change. The main assumption of the calculation was to reduce the 50% historical emission from the forest sector (76.3 million tCO_2e) by 2030 (38.1 million tCO_2e) with an average annual reduction of 21 million tCO_2e/year. (Further information on the NDC scenarios is provided in Appendix 6). The estimated emission reductions under the NDC scenario are shown in Figure 8 below.

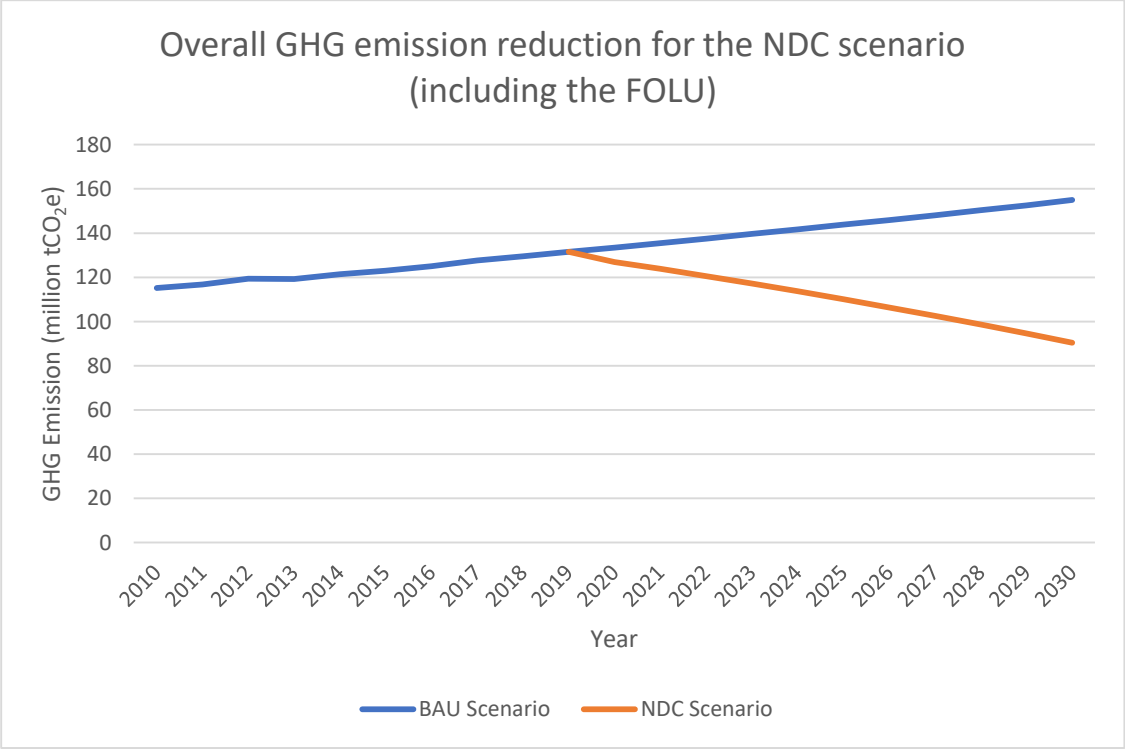


Figure 8 Overall GHG emission reduction (including the FOLU)

As per Figure 8, the estimated emission reductions with the FOLU by 2030 under the NDC scenario will be approximately 64.6 million tCO_2e/year (41.7% reduction, of which 59.1% is from the FOLU).

The NDC Scenario - contributions by different sectors

The share of distribution of the planned emission reductions under the NDC scenario among the sectors is indicated in Figure 9 below.

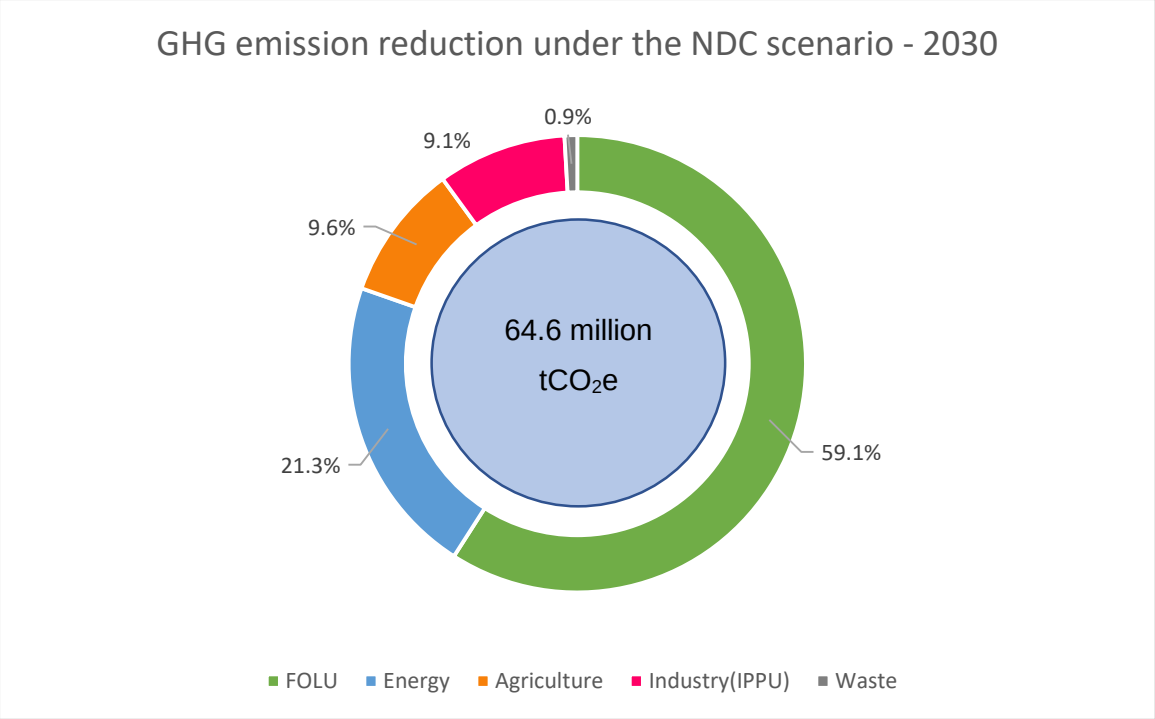


Figure 9 GHG emissions reduction under the NDC scenario in 2030

Table 6 Sectoral share and absolute number of GHG emission reduction under NDC scenario in 2030

Sector	Sectoral share (%)	GHG emission reduction ($MtCO_2e$)
FOLU	59.1	38.1
Energy	21.3	13.7
Agriculture	9.6	6.2
Industry (IPPU)	9.1	5.9
Waste	0.9	0.6
Total	**100%**	**64.6**

The emissions reduction of 64.6 million tCO_2e/year is expected by 2030. This is a 41.7 % reduction compared with the BAU case.

The FOLU is expected to provide the major share of 59.1% emission reduction by 2030. Other sectors like energy (21.3%), agriculture (9.6%), industry (IPPU) (9.1%), and waste (0.9%) are also expected to contribute significantly.

This approach will have a better resilience to failure in mitigation activities. One disadvantage of the involvement of many sectors could be the need for more experts in many fields. However, this could be considered as an opportunity to develop or strengthen Cambodia's capacity.

Mitigating emissions from the electricity sector will be directed mainly on the renewable energy power generation. There will be barriers imposed by the availability and the absorption capacity of the grid, which would have to be addressed for the achievement of targets.

Mitigating the transport sector emissions would require policy instruments and carbon pricing instruments to promote low emission transport modes. Social acceptance would depend on the chosen approaches, public awareness-raising activities, and the instruments used.

The other industrial sector will expand and play a major role during Cambodia's development. Therefore, the energy efficiency and process development of existing as well as new industries will have to be improved in order to minimize the effect on emissions. As the cost of the RE is on the reducing trend use of the renewable energy will be a cost-effective mitigation strategy.

2.3 Mitigation measures

The Department of Climate Change (DCC) of the GSSD, supported by the Cambodia Climate Change Alliance (CCCA), has been coordinating stakeholder engagement and collecting submissions from line ministries on priorities for the NDC revision for both mitigation and adaptation activities. The template used to ensure comparability across mitigation actions is the following.

Table 7 Template for ministerial submissions for Mitigation Projects

No	Mitigation action	Government priority	GHG mitigation potential	Targets	Co-benefits (environmental, social, adaptation)	Finance		Technology availability	Gender	Final score
						Costs	Benefits			

Scoring

Government priority:
1=not in line with a government priority
2= no government policy in place
3=in line with the government priorities

Mitigation potential (as example)
1= 0 k-15k,
2=15k-30k,
3=30k-60k,
4=60k-100k,
5=>100k tCO_2e/year

Targets:
1= target is difficult to reach
2= target is easy to reach

Co-benefits:
1= action does not have many co-benefits
2= action has many co-benefits

Finance:
1= cost/benefits= negative
2=cost/benefits=medium
2= cost/benefits= positive

Technology:
1= not available
2= available

Gender:
1= no impact on equality, no gender inclusion possible
2= medium impact on equality, medium gender inclusion possible
3= good possibility to build equality, gender inclusion

Mitigation actions were identified from the NDC related information provided by the relevant ministries (MAFF, MISTI, MLMUPC, MME, MoE, MOEYs, MoT, MPWT, and NCDD). These projects were filtered and a list of mitigation projects was prepared. The mitigation projects are distributed among seven sectors: energy, waste, industry, transport, agriculture, building, and the FOLU. Table 8 shows the identified list.

No	Mitigation Projects/Activities	Lead Ministry	Sector
1	Promote sustainable energy practices in manufacturing *Garments: 2.291 $MtCO_2e$, 55% by 2030* *Bricks: 1.799 $MtCO_2e$, 44% by 2030* *Food and Beverage: 1.043 $MtCO_2e$, 25% by 2030*	MISTI	Other Industries
2	Urban Planning Tools for Climate Change Mitigation and the urban planning solution in three sub cities	MLMUPC	Building residential Building commercial
3	Application of electrical equipment's labelling & MEPS (Lighting, Cooling & Equipment) *Reduce 1.2 TWh (29.7%) of electricity use in 2030*	MME	Building residential Building commercial
4	Improvement of process performance of EE by establishment of energy management in buildings/industries *Voluntary scheme for other companies, especially for SMEs to reduce 10% in 2030*	MME	Other Industries Building residential Building commercial
5	Public awareness campaigns, DTEBP-EE info centres *Reduce 2% of energy consumption in 2030*	MME	Building residential Building commercial
6	Building codes and enforcement/certification for new buildings and those undergoing major renovation *Reduce 10% of electricity consumption in 2030*	MME	Building commercial
7	Introduction of efficient electrical motors and boilers *Reduce 2.3% of current electricity consumption in 2030*	MME	Building commercial Other Industries
8	Improve sustainability of charcoal production through enforcement of regulations	MME	Building residential
9	Roadmap study on Integration of RE (Renewable Energy) resources. *25 % of the renewable energy in the energy mix (solar, wind, hydro, biomass) by 2030*	MME	Energy generation
10	New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill *Increase the share of waste disposed at sanitary landfills with LFG extraction from 0% in 2020 to 50% by 2030 and extract LFG from the Dangkor Landfill*	MoE	Waste -MSW
11	Composting of biodegradable organic fraction of MSW supplemented with separation of organic waste (at source). *If 10% of all MSW generated is composted by 2030*	MoE	Waste -MSW

No	Mitigation Projects/Activities	Lead Ministry	Sector
	then up to 0.5 $MtCO_2e$/year of GHG emissions can be avoided by 2030		
12	Production of Refuse-Derived Fuel (RDF) from either a) fresh MSW or b) old MSW mined from the Dangkor landfill. *GHG ER from RDF + anaerobic digestion up to 0.2 $MtCO_2e$/year*	MoE	Cement sector Waste _MSW
13	Implementation of National 3R strategy	MoE	Waste -MSW
14	Enhance maintenance and inspection of vehicle (Piloting maintenance and emission inspections of vehicles) *30 vehicle inspection centres in operation by 2030*	MPWT	Passenger transport
15	Promote integrated public transport systems in main cities	MPWT	Passenger transport
16	Reducing GHG emission though off grid street lightening of rural municipality *10 Sangkat of Senmonorom municipality, Kep municipality, and Preah municipality integration of climate change into financial management, institutional arrangement and policy reform by 2028.*	NCDD	Building commercial Building residential
17	Bio-digesters construction (85% reduction compared to 2000) (Small size (2-3-4m^3)	MAFF	Building residential Agriculture land related
18	Bio-digesters construction (85% reduction compared to 2000) Medium size(6-8-10m^3)	MAFF	Energy generation Agriculture land related
19	Bio-digesters construction (85% reduction compared to 2000) Large size(>10m3)	MAFF	Energy generation Agriculture land related Waste -MSW
20	Centralized recycling facility for industrial waste from the garment sector *Reduce 0.11$MtCO_2e$ from 2021-2030at an average of 0.01 $MtCO_2e$/year*	MISTI	Waste -MSW
21	Climate-friendly cooling of public sector buildings *Reduce 0.04 $MtCO_2e$ /year*	NCSD	Building commercial
22	Toward Battambang city to green city *5 Sangkat of Battambang municipality integration of green city by 2025*	NCDD	Building commercial & Residential
23	Shift long distance freight movement from trucks to train	MPWT	Freight Transport
24	Emission management from factories	MoE	Other Industry

No	Mitigation Projects/Activities	Lead Ministry	Sector
	Monitor air quality at 105 factories annually and provide permit letter for emission to the air to 90 factories. *90% of factories to be licensed.*		
25	Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)	MAFF	Agriculture land-related
26	Organic input agriculture and bio-slurry; and deep placement fertilizer technology *10 Provinces by 2030*	MAFF	Agriculture land-related
28	Promote manure management through compost making process to reduce carbon emission *25 provinces and cities by 2030*	MAFF	Agriculture land-related
29	Better management of industrial wastewater in the food & beverage sector *5-10% of total CH_4 emissions*	MISTI	Wastewater
30	Implementation of National Cooling Action Plan *Enhanced MEPS and F-gas transition for room air conditioners and residential refrigerators targeting the new & existing equipment stock in the country.*	MLMUCP	Building commercial
31	Inclusion of performance requirements of Passive Cooling Systems in Building Energy Code of Cambodia *20% of the newly constructed buildings will comply with Building Energy Code*	MLMUCP	Building commercial
32	Implementation of "passive cooling" measures in the cities (addressing urban heat island effect [UHIE]), public buildings and commercial buildings. - *cities (Phnom Penh and Siem Reap) analysed for mitigating UHIE and projects are implemented* - *2% of the existing public and commercial buildings are retrofitted with passive cooling measures*	MLMUCP	Building commercial

Source: Ministries' submissions

(Project level emissions were submitted by the line ministries listed under Appendix 5).

Table 8 The FOLU targets (detailed list of actions are listed in the Appendix 5)

No	FOLU activities/target	Lead Ministry	Sector
1	FOLU: Reduce 50% of historical emission by 2030 Activities: - Improve management and monitoring of forest resources and forest land use - Strengthen implementation of sustainable forest management - Approaches to reduce deforestation, build capacity, and engage stakeholders	REDD+ Technical Secretariat (RTS)	FOLU

Source: Ministerial submissions and REDD+ Technical Secretariat (RTS)

3 Adaptation Contribution

Adaptation features strongly in Cambodia's initial NDC and is equally important in this updated NDC, due to the country's continued high vulnerability to climate change.

3.1 Cambodia's vulnerability to climate change

According to several international climate change indices, Cambodia is one of the most vulnerable countries to the adverse impacts of climate change[4]. The Global Climate Risk Index (1999–2018)[5] placed Cambodia at 12th place among the most vulnerable countries globally. The World Risk Index (2019)[6], calculated as a product of exposure and vulnerability, categorised Cambodia as among the 'very high' impacted countries.

Rising temperatures are likely to lead to increased frequency and intensity of extreme weather events in a fragile socio-economic context. The country's climate vulnerability results in loss and damage to human life, livelihoods, and the national economy, as well as the degradation of her natural resources. The country is particularly vulnerable to floods, droughts, windstorms, and seawater intrusion. According to a series of vulnerability assessments carried out in 2016[7], 17.5% of Cambodia's communes were 'highly' vulnerable (i.e. 288 communes) and 27.28% (449 communes) were 'quite' vulnerable to multiple climate change hazards.

Notably, recent research[8] indicates that without climate change, the real GDP will grow at an average of 6.9% per year from 2017 to 2050, achieving Upper Middle-Income Country (UMIC) status in 2035. With climate change, the headline projections use the mid-climate change scenario and a mid-adaptation scenario that is equivalent to current levels of adaptation. Climate change reduces average GDP growth to 6.6% and absolute GDP by 0.4% in 2020, 2.5% in 2030, and 9.8% in 2050. As a result, the UMIC status may be delayed by one

4 Source: GSSD (2017)

5 Source: Eckstein et al. (2019)

6 Source: Bündnis Entwicklung Hilft (2019)

7 The information is queried from the Commune Database

8 Source: NCSD (2016)

year. Accordingly, Cambodia has begun developing her National Adaptation Plan (NAP). The NAP process builds on work carried out as part of the National Adaptation Plan of Action (NAPA), the Second National Communication (SNC) and the CCSAP, among others. The NAP identifies climate change impacts, vulnerability, and adaptation actions for Cambodia.

3.2 Impacts and priorities for adaptation and resilience

Cambodia's vulnerability is characterised by frequent flooding and irregular rainfall, coupled with an agrarian based economy, limited human and financial resources, insufficient physical infrastructure, and limited access to technologies. Socio-economic status, as well as location, access to resources and technology all influence Cambodia's ability to manage the impact of climate change. Different social groups experience climate vulnerability differently and women, children, the disabled, the elderly and other socially marginalised groups often feel the impacts of climate change disproportionately.

For the development of the SNC[9], climate change impacts and vulnerability were assessed for the most vulnerable sectors, namely agriculture and water resources, forestry, coastal zones, and human health.

- **Agriculture and water resources:** Under future climate conditions (2025 and 2050), most of Cambodia's agricultural areas will be exposed to higher risks of drought. Based on data from the past 20 years, losses in production were mainly due to flooding (about 62%) and drought (about 36%). Most flooding occurs due to increased water levels in the Mekong River and Tonle Sap Lake between early July and early October. Disruptions to logistical corridors caused by floods have a profound impact to agricultural supply chains, both domestically and for international trade. The impact of climate change on yield is quite significant. Under the high emission scenario (SRES-A2)[10], wet season rice yield (rain-fed) is continuously expected to decrease until 2080 and could fall by up to 70% of current yield levels. Similarly, for the dry season, (irrigated) rice yields for crops planted in November and December

[9] NCSD (2015)
[10] NCSD (2016)

could decrease by 40%. The negative impacts on agricultural production can lead to breakdown of food systems, and vulnerable groups risk further deterioration into food and nutrition crises if exposed to extreme climate events. Adaptation strategies, for example additional time in sourcing water or pasture, can particularly affect women labour allocation, in turn influencing time available for childcare and feeding (e.g. breastfeeding exclusively, preparing healthy meals). Further strain on the workload of women and climate change related stress during pregnancy could contribute to low birth weight, leading to increases in risks of undernutrition and non-communicable diseases[11].

- **Forestry**: More than 4 million hectares of lowland forest, especially those located in the northeast and southwest, which currently have a water deficit period of between four and six months, will become exposed to a water deficit period of between six and eight months or more. A decrease in forest cover may in turn have negative implications for the population, especially children, through micronutrient deficiencies[12]. Moreover, decreased forest cover, either from climate change or deforestation, increases the risk of landslides[13].
- **Coastal zones:** Rising sea levels are expected to impact coastal systems through inundation, flood and storm damage, loss of wetlands, erosion, saltwater intrusion, and rising water tables. Analysis of the impact of sea-level rises on coastal areas suggests that a total area of about 25,000 ha would be permanently inundated by a sea level rise of one metre, increasing to 38,000 ha at a sea level rise of two metres. Under a high emissions scenario, and without large investments in adaptation, an annual average of 30,700 people are projected to be affected by flooding due to sea level rises between 2070 and 2100[14]. Cambodia also faces inland river flood risks. It

[11] Gender, Climate change, Health WHO: https://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1; Gender statistics for key sectors in Cambodia: https://www.jica.go.jp/project/cambodia/011/news/general/ku57pq00001xwvts-att/20150308_01.pdf Gender statistics for key sectors in Cambodia: https://www.jica.go.jp/project/cambodia/011/news/general/ku57pq00001xwvts-att/20150308_01.pdf

[12] Impacts of forests on children's diet in rural areas across 27 developing countries: https://advances.sciencemag.org/content/4/8/eaat2853?utm_source=TrendMD&utm_medium=cpc&utm_campaign=TrendMD_1

[13] Deforestation Effects on Rainfall-Induced Shallow Landslides: Remote Sensing and Physically-Based Modelling https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019WR025233

[14] From WHO Climate and Health Profile Cambodia 2015: https://apps.who.int/iris/rest/bitstreams/1064308/retrieve

is projected that by 2030 an additional 69,800 people may be at risk of river floods annually as a result of climate change, above the estimated 89,700 annually affected population in 2010.

- **Human health:** Under a high emissions scenario, the mean annual temperature is projected to rise by about 4.2°C on average from 1990 to 2100. This will negatively impact the most vulnerable populations, especially children and the elderly, particularly through heatwaves[15]. Higher temperatures and variable precipitation accelerates microbial growth, transmission and virulence, can lead to changes in the seasonal and geographic distribution of vector-borne and water-borne diseases[16]. The spatial pattern of malaria risk in Cambodia has been found to change as rainfall and temperature change in the future. The transmission risk tends to increase until 2050, and then decreases again in 2080[17]. High temperature and precipitation changes can also result in lower food production in the tropics as well as heat-related diseases.

In addition, the SNC highlighted gaps in information on the role of ecosystems and natural protection assets such as soils, forests, coral reefs, and sea grasses in preventing losses due to climate change, as well as helping to build adaptive capacity.

Cambodia's adaptation contribution follows the planning and implementation cycle of the NAP process and integrates elements that are specific to the NDC.

[15] WHO Climate and Health Profile Cambodia 2015: https://apps.who.int/iris/rest/bitstreams/1064308/retrieve
[16] Children's Environment and Health in East Asia and the Pacific: https://www.unicef.org/eap/reports/childrens-environment-and-health-east-asia-and-pacific
[17] NCSD (2016)

Figure 10 NDC-NAP linkages

Source: CDKN (2016)

3.3 Prioritised adaptation actions

Similarly, to mitigation, the template used to ensure comparability across adaptation actions is illustrated below.

Table 9 Template for ministerial submissions for Adaptation

No.	Adaptation action	Government priority	Resilience building potential	Targets	Co-benefits (mitigation, environmental, social)	Finance		Technology availability	Gender	Final score
						Costs	Benefits			
1.	Action									

Scoring

Government priority:
1=not in line with a government priority;
2= no government policy in place;
3=in line with a government priority

Resilience potential: Vulnerable communities targeted etc.
Targets:
1= target is difficult to reach;
2= target is easy to reach

Co-benefits:
1= action does not have many co-benefits;

2= action has many co-benefits

Finance:
1= cost/benefits= negative;
2=cost/benefits=medium;
3= cost/benefits= positive

Technology:
1= not available;
2= available

Gender:
1= no impact on equality, no gender inclusion;
2= medium impact on equality, medium gender inclusion;
3= good possibility to build equality, gender inclusion.

All line ministries with adaptation relevance submitted their proposed priority actions, which are presented in Annex 2.

3.3.1 Prioritised adaptation actions

The following table summarises the proposed adaptation actions subdivided by sectors and the corresponding lead ministry.

The focus sectors, in line with the vulnerability of the country, are the followings (58):

- Agriculture, including agribusiness, animal health and production, agriculture / energy, and agriculture / gender (17 actions)
- Coastal zones (2 actions)
- Energy (2 actions)
- Human health (5 actions)
- Industry (1 action)
- Infrastructure – including roads, buildings, and urban land use planning (15 actions)
- Livelihoods, poverty, and biodiversity (7 actions)
- Tourism (3 actions)
- Water resources (6 actions).

Table 10 Priority adaptation actions

	Adaptation action	Sector / Sub sector	Ministry
1	Towards an Agroecological transition in the uplands of Battambang	Agriculture	NCDD
2	Development of Rice crops for increase production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement	Agriculture	MAFF
3	Development of Horticulture and other food crops for increase production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement	Agriculture	MAFF

	Adaptation action	Sector / Sub sector	Ministry
4	Development of Industry crops for increase in production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement	Agriculture	MAFF
5	Improvement of support services and capacity building to crop production resilient to climate change by promoting research, trials and up-scaling climate-smart farming systems that increase resilience to CC and extreme weather events	Agriculture	MAFF
6	Building climate change resilience on cassava production and processing	Agriculture	MAFF
7	Research for the development and enhancement of agricultural productivity, quality, and transfer through strengthening of crop variety conservation and new crop variety release responding to the impacts of climate change	Agriculture	MAFF
8	Development of new technologies and increased yields by using new crop varieties which adapt to climate change	Agriculture	MAFF
9	Development of rubber clone varieties suitable for AEZ and resilient to climate change	Agriculture	MAFF
10	Enhancing institutional and capacity development on climate change impact, vulnerability assessment, adaption measures and mitigation related to rubber sector	Agriculture	MAFF
11	Improvement of animal breeding technology in Cambodia through AI which can adapt to climate change	Agriculture	MAFF
12	Promotion of research capacities on animal genetic, animal breeding, and animal feed is strengthened to adapt to climate change	Agriculture	MAFF
13	Strengthening capacities for risk prevention and reduction, effective emergency preparedness and response at all levels; enhancing livestock and disease-related early warning system, and integrating disaster risk reduction and climate change adaptation measures into recovery and rehabilitation initiatives in the livestock sector	Agriculture	MAFF
14	Promoting aquaculture production systems and practices that are more adaptive to climate change	Agriculture	MAFF
15	Promoting climate resilience in the capture fisheries sector	Agriculture	MAFF
16	Scaled up climate-resilient agricultural production through increased access to solar irrigation systems and other climate-resilient practices	Agriculture	NCDD
17	Developing a training manual and providing training on approaches for development of climate-smart and sustainable livelihood to rural poor people	Agriculture	MRD
18	Protection, risk mitigation, and resilience building from marine pollution particularly caused by activities on land including marine pollution from waste and aquaculture activities.	Coastal zones	MOE
19	Effective management and protection of ecological systems of marine and costal zones to avoid adverse impacts from various factors, build their resilience and restore its functions for productive and healthy oceans	Coastal zones	MOE
20	Conduct climate risk analysis for the existing electricity infrastructures and provide recommendations	Energy	MME
21	Climate proofing existing and future solar/hydropower infrastructure	Energy	MME

	Adaptation action	Sector / Sub sector	Ministry
22	Enable effective decision-making for health interventions through generation of information and improved surveillance or early-warning systems	Human health	MOH
23	Enhance climate resilience in health service delivery	Human health	MOH
24	Strengthen and provide capacity building of technical guidelines for diagnosis, detection, control, prevention and treatment of vector-borne and water-borne diseases, injuries and other food poisoning illnesses arising from climate change	Human health	MOH
25	Conduct water sanitation and hygiene (WASH) assessments on climate change and develop planning for communities and health facilities.	Human health	MOH
26	Strengthen institutional capacities to effectively integrate climate risks and adaptation options in health sector planning and implementation	Human health	MOH
27	Heat stress adaptation for industrial production	Industry	MISTI
28	Integrating climate change response measures onto the construction design for buildings and for rural housing (use of modern integration of technology)	Infrastructure - Buildings	MLMUPC
29	Develop resilient infrastructure of school buildings in response to climate change	Infrastructure - Buildings	MOEYS
30	Implement climate change and disaster resilient construction and infrastructure standards including for public sector and community-focused buildings covering public health, education, WASH etc.	Infrastructure - Buildings	NCDM
31	Prepare spatial planning (city/district/municipality) guidelines at all levels for climate change adaptation Integrating climate change response measures to the commune land use planning	Infrastructure - Land use planning	MLMUPC
32	Integrating climate change response measures to the policy of social land concession (SLC) and its procedures	Infrastructure - Land use planning	MLMUPC
33	Prepare modality of standardized green spaces for urban planning or new sub-cities to address vulnerability of urbanization.	Infrastructure - Land use planning	MLMUPC
34	Vulnerability assessment towards the development of climate change strategic plans to respond to the impacts on land, housings, coastal management and building due to climate change	Infrastructure - Land use planning	MLMUPC
35	Promote Land Use Planning Tools for urban houses and building construction adaptive to climate change benefits to the low-income and homeless people	Infrastructure - Land use planning	MLMUPC
36	Promote proper low-cost shelters for low-income households resilient to climate change, practically in the area of social land concession	Infrastructure - Land use planning	MLMUPC
37	Development of building code with mainstreaming climate change into building designs	Infrastructure - Land use planning	MLMUPC
38	Mainstream climate change response measures into coastal development planning against sea water intrusion, sea water rise and seasonal storm destruction, and rising temperature	Infrastructure - Land use planning	MLMUPC

	Adaptation action	Sector / Sub sector	Ministry
39	Strengthening Climate Resilient Cities	Infrastructure - Land use planning	NCDD
40	Develop national road construction and maintenance design standards for national and provincial roads, considering climate change impacts, including developing an M&E framework for climate proofing and low-carbon technology roads	Infrastructure - Roads	MPWT
41	Repair and rehabilitate existing road infrastructure and ensure effective operation and maintenance systems, considering climate change impact	Infrastructure - Roads	MPWT
42	Rural road rehabilitation and improvement for climate change resilience	Infrastructure - Roads	MRD
43	Develop and annually update national and subnational multi-hazard and climate risk assessments, including the identification of the most vulnerable communities	Livelihoods, poverty and biodiversity	NCDM
44	National end-to-end early warning systems with focus on effective dissemination to populations at risk	Livelihoods, poverty and biodiversity	NCDM
45	Implement community–based disaster and climate risk management programs	Livelihoods, poverty and biodiversity	NCDM
46	Building resilience of biodiversity conservation and restoration to adapt to climate change	Livelihoods, poverty and biodiversity	MOE
47	Integrated village development	Livelihoods, poverty and biodiversity	MRD
48	Strengthen flood resiliency capacity of communities around lake Tonle Sap (access to clean water, off grid renewable energy and waste management)	Livelihoods, poverty and biodiversity	NCDD
49	Building climate resilient livelihood and public infrastructures in social land concession for vulnerable communities	Livelihoods, poverty and biodiversity	NCDD
50	Provide capacity building and supports for climate change innovation at the provincial along Tonle Sap River	Tourism	MOT
51	Raising public awareness on climate change innovation at all levels	Tourism	MOT
52	Practicing smart agriculture in tourism sector	Tourism	MOT
53	Establish an automated nation-wide hydromet monitoring network and data transmission program, including the collection of climate and hydrological data	Water resources	MOWRAM
54	Establish a centralized and standardized approach to climate-resilient water management	Water resources	MOWRAM
55	Establish a national climate and flood warning system, including a service centre and flood emergency response plans	Water resources	MOWRAM
56	Integrated groundwater management in Cambodia	Water resources	NCDD
57	Establish nationally standardized best-practice systems for irrigation	Water resources	MOWRAM
58	Resilient and Adaptive rural water supply and sanitation construction	Water resources	MRD

Source: Ministries' submission

3.3.2 Enabling actions

In addition, a number of Ministries also play an enabling role to facilitate the implementation of actions within the NDC. Such actions can be divided into the followings (29):

- Education (4 actions)
- Gender (6 actions)
- Governance (2 actions)
- Information (4 actions)
- Knowledge sharing (1 action)
- Policy and planning (12 actions)

Table 11 Enabling actions

No.	Action	Cross-cutting	Lead Ministry
1	Upgrading curriculum and training methodologies, including libraries, to include climate change subjects in primary schools	Education	MOEYS
2	Upgrading curricula to include climate change for non-formal education	Education	MOEYS
3	Build centres of excellence for delivering climate change courses and research among Universities	Education	MOEYS
4	Conduct training for education officials on climate change e.g. as a required component of teacher training	Education	MOEYS
5	Strengthen institutional capacities at national and sub-national levels to integrate gender responsiveness in climate change adaptation policies, plans, programming, including gender sensitive budgeting	Gender	MOWA
6	Enhance coordination and implementing accountability mechanisms to reduce climate change vulnerabilities of disadvantaged women and other marginalized groups such as ethnic minority women and men, People with Disabilities (PWD), youth, and the elderly	Gender	MOWA
7	Enhance monitoring and evaluation systems of sectoral ministries to track gender outcomes in climate change initiatives with a particular focus on collecting and managing sex-disaggregated data, gender indicators and budgeting, outcome-based reporting and the dissemination and up-scaling of the gender and climate change adaptation related knowledge generated.	Gender	MOWA
8	Capacity Development for GCCC members and sectoral ministries on Gender analysis, gender responsive budgeting and NDC	Gender	MOWA
9	Develop technical guidelines for Gender mainstreaming in NDC process	Gender	MOWA
10	Market supply chain of rural women entrepreneurs resilient to climate change	Gender	NCDD
11	Local government and Climate Change-III (LGCC3)	Governance	NCDD
12	Reducing vulnerability of local communities though sub-national climate governance reform (focusing on policy)	Governance	NCDD

No.	Action	Cross-cutting	Lead Ministry
13	Enhance the quality of broadcasting means and expand the capacity of coverage for raising awareness on climate change nationwide	Information	MOINF
14	Training and enhancing human capacity on climate change in the information sector	Information	MOINF
15	Urge private media organizations to participate in covering climate change related topics and to complement state broadcasting agencies.	Information	MOINF
16	Urge and encourage to reduce (or ban) all forms of commercial advertisement that has negative impact on the environment	Information	MOINF
17	News coverage and program production for awareness raising on climate change and its impacts	Knowledge sharing	MOINF
18	Building climate resilience for district and commune governance through policy and strategic development plan reform (Focus on implementation)	Policy and planning	NCDD
19	Mainstreaming climate change into Education Strategic Plan 2019-2023 Strategic Plan and SDG4 Roadmap for Education 2030	Policy and planning	MOEYS
20	Strengthen the cooperation with local and International development agencies, NGOs and relevant institutions for technical and financial support to implement the adaptation planning in the media sector	Policy and planning	MOINF
21	Development of climate change national/capital/ provincial development plans including an M&E system with specific indicators	Policy and planning	MOP
22	Development of a climate change public investment program for the national/capital/ provincial levels	Policy and planning	MOP
23	Building adaptive and resilient capacity for MRD officers at national and sub-national level for mainstreaming climate change into rural development planning processes and technical design.	Policy and planning	MRD
24	Build adaptive capacity on climate change for Village leaders (Village Development Committees, VDCs)	Policy and planning	MRD
25	Strengthen resilience and adaptation capacity to climate change in the most vulnerable provinces/districts/communes (produce vulnerability index maps at the commune level, integrate climate change into investment and development plans, demonstrate the identified actions at pilot sites)	Policy and planning	NCSD
26	Update and implement the Cambodia Climate Change Strategic Plan (CCCSP) for 2024-2033	Policy and planning	NCSD
27	Integrate climate change measures into national policies, strategies and sectoral strategies and plans	Policy and planning	NCSD
28	Enhance institutional capacity on climate change (mitigation, adaptation, policy, strategies, planning, and finance) through awareness raising, training, and advocacy.	Policy and planning	NCSD
29	Development of a long-term low emission strategy	Policy and planning	NCSD

Source: Ministries' submissions

4 Cross-cutting areas

The initial NDC was developed in a short period of time, which made far-reaching consultations challenging. As such, it was understood that some crucial areas of climate change policy and implementation were not adequately analysed, specifically **1) Gender; 2) Youth involvement; and 3) Private sector engagement.** Most Ministries included the implications of each action across these areas. These are presented and summarised below. It is also important to highlight an additional area related to **Indigenous People**. The Cambodian Constitution recognises that all Khmer citizens (which include indigenous people under the National Policy on the Development of Indigenous Peoples) are equal before the law regardless of race, colour, national origin, etc. Indigenous people are also protected by the Land Law (2001), the Forest Law (2002), the Protected Areas Law (2008), and the National REDD+ Strategy, among others. During the NDC implementation and particularly for mitigation measures in the FOLU, the RGC will seek to promote the rights of indigenous peoples, specifically concerning land ownership. Respect for the traditional knowledge held by indigenous peoples is integral to an understanding of traditional livelihoods and of culture and is, therefore, an essential component of safeguarding these rights.

4.1 Gender

4.1.1 Overview

Climate change affects gender minorities disproportionately, including women and girls. The areas where women play a central role - food security, nutrition, energy, livelihoods, health, natural resource management, among others - are those most directly impacted by climate change. By exaggerating gender inequality, climate change also reinforces a structural root cause of violence against women and girls[18].

In prioritising climate solutions, a gender-balanced approach should incorporate the intersectional needs of the population to ensure inclusivity. Addressing gender inequalities

[18] Gender, Climate change, Health WHO: https://www.who.int/globalchange/GenderClimateChangeHealthfinal.pdf?ua=1

is, therefore, a priority for Cambodia and gender has been effectively mainstreamed across planning and budgeting, including in the context of addressing climate change.

Notably, the CCCSP includes a strategic objective to '*reduce sectoral, regional, gender vulnerability and health risks to climate change impacts*'. The Ministry mandated with planning and facilitating the implementation of gender issues is the Ministry of Women's Affairs (MOWA). The MOWA has formed a Gender and Climate Change Committee, which gathers information on gender and climate change, conducts studies on the impact of climate change on women and children and builds climate change capacity in the ministry's departments. The MOWA has also integrated climate change, green growth, and disaster risk management into Neary Rattanak IV, the National Policy on Gender Equality and Women's Empowerment. In addition, as part of Cambodia's periodic reporting to the Convention on Ending all Forms of Discrimination Against Women (CEDAW), the Cambodia National Council for Women (CNCW) responds specifically to the disproportionate impacts of climate change on rural women and acknowledges the policy and programme efforts underway in Cambodia to mitigate these impacts[19].

As part of this NDC update, all Ministries acknowledged the importance of addressing gender issues, particularly women's participation in climate action. Most priority actions have a specific target for women's participation that ranges from 15% to 70%. Gender and age disaggregated data are crucially important in measuring the success of the gender targets, not only related to women's participation but also women's access to skills and technology, as well as women in climate-related decision making.

4.1.2 Mitigation

Mitigation priority actions, including energy, waste, and transport, all have linkages to gender equality and social inclusion and the potential to contribute to several gender-based indicators. In relation to energy priorities such as (1) access to energy in rural areas and (2) the diversification of household and community energy generation sources to reduce reliance on biomass as an energy source, women are often responsible for household energy-related decisions in rural areas, and women, the poor and the marginalised are often last to

[19] CEDAW (2018) Sixth periodic report submitted by Cambodia under Article 18 of the Convention, due in 2017.

gain energy access. Gender-responsive mitigation actions and indicators will help measure these changes and also contribute to measuring the success of SDG 5, Cambodia's CEDAW commitments, and the CCCSP.

All mitigation sectors have encouraged the equal involvement of men and women in mitigation actions. However, the waste and energy sectors show a higher tendency of maintaining a gender balance and encouraging women's participation. For example, women and children often constitute a large portion of informal waste pickers. Therefore, formalising the waste sector management and creating decent jobs could have a significant impact on ensuring stable livelihoods for women. Projects such as those in the composting market can benefit both men and women.

There is high potential to contribute to gender equality through increasing energy access in rural areas, by diversifying household and community energy generation sources. For example, by reducing the reliance on biomass as an energy source. Women are also often responsible for the majority of household energy-related decisions in rural areas. Gender equality can be encouraged in mitigation actions such as through eco-payments.

In the transport sector, women generally use public transport more than men. Ensuring safe, efficient and comfortable transport for women may increase their access to higher education centres, skills development centres and other resources in urban areas.

Women constitute a higher proportion of the working population in agriculture, and the forestry sector is seen as providing strong opportunities to improve gender balance. In the forestry sector, and particularly for REDD+, there is a need to recognise the diversity of stakeholders, particularly among forest communities. In addition to continuing the enhancement of 'invited spaces' for women's groups, it will be important for gender outcomes to be adequately captured in the country's REDD+ Safeguards Information Systems and the broader REDD+ monitoring system.

4.1.3 Adaptation

Skilled agricultural, forestry, and fishery workers are the most common occupations (31%) among Cambodia's working population[20]. Women (32.5%) make up slightly more of the employed population than men (28.5%)[21]. This category, however, this does not account for the self-employed or those working their own land, which is very common in Cambodia's agrarian-based economy. Women have a strong role to play in this sector and in value chain development in particular. Priorities include the need to increase women's income generation while decreasing their work burden by improving agricultural practices and access to technology, as well as fostering women's collective working groups.

In terms of infrastructure, particularly in climate proofing of buildings and roads, opportunities for women to contribute more prominently to restoration and construction are needed, in order to increase their access to income and livelihoods.

In the human health sector, the importance of gender-disaggregated data is considered a priority, especially to understand the different impacts of air-and vector-borne diseases on women and men. This is of particular significance to women, who often carry the burden of household care including medical care for the family, but who also play an important role in championing behavioural patterns which may improve health and hygiene and reduce disease spread[22]. In Disaster Risk Management (DRM), little gender-disaggregated data collection exists, therefore information on the differentiated impacts of disasters on women, the elderly, children, disabled people, and other socially marginalised groups is largely anecdotal. Data collection needs to be prioritised and the role of women in DRM strengthened, particularly in the potential role women and children can play a key role in developing and monitoring emergency response plans.

4.1.4 Enabling actions

It is crucial to develop training and awareness materials that take particular gender-based needs and priorities into account to ensure that women and girls benefit equally from

[20] National Institute of Statistics (2018). CSES 2017 Final Report
[21] National Institute of Statistics (2018). CSES 2017 Final Report
[22] See Cambodia's Second National Communication to the UNFCCC (2015) for more information and targets on reducing risk to and death due to malaria transmission.

climate action. The training of trainers and 'women champions' are being rolled out in an effort to reach women in particular, and this work will be continued and scaled up where possible. The linkages between more targeted education and an increase in school enrolment for children, in particular girls, are also key to ensure the impacts of climate change do not disproportionately affect girls in terms of access to, and the completion of, education.

4.2 Youth involvement

4.2.1 Overview

The Ministry of Education, Youth, and Sports (MoEYS) is the lead Ministry mandated with ensuring youth engagement in all relevant sectors, including in climate change. Some Ministries have indicated where youth engagement can be most appropriate.

4.2.2 Mitigation

The involvement of youth in mitigation actions tends to be lower than in adaptation. However, youth are encouraged to participate in programmes in the relevant sectors, including energy, industry, and transport.

4.2.3 Adaptation

In the infrastructure sector, youth could provide inputs in construction design, given their role as workers. In DRM they can promote and share knowledge of Early Warning Systems (EWS) with their communities. In human health and water resources (especially conservation), their role in awareness-raising campaigns is crucial. Youth also play a key role in the tourism sector, from working in eco-tourism to promoting local organic products. Youth are also a target of higher education abroad programmes, especially in the water resources sector. Overall, they can engage in volunteering activities related to education, training, and outreach and also through specific media programmes.

4.2.4 Enabling actions

Beyond direct engagement in these sectors, children and youth play a critical role in the development, implementation, monitoring, and enforcement of climate actions across sectors – they need to be engaged at the national and local levels to participate meaningfully in the development of climate policies, including the NDC and NAP. They need to be empowered to be able to act as leaders of the next generation, educated on their

environmental rights and equipped with the necessary skills, knowledge and training for a green transition.

4.3 Private sector engagement

4.3.1 Overview

Most actions will be effective only through the engagement of the sector-appropriate private sector players, including through Public Private Partnerships (PPPs). Private sector entry points have been identified with most of the ministries, and engagement is highlighted in the NDC implementation through directed actions. Private sector partners will need to be engaged to develop PPPs for climate solutions, beyond a donor-based approach, that can be applied sector-wide.

Some of the challenges and opportunities for PPPs include[23]:

- An absence of reliable data on private sector investments, including difficulties in identifying adaptation measures supported by the private sector and issues in covering all parts of the economy;
- The size of the informal sector which accounts for more than half of Cambodia's GDP; and
- Small and medium sized enterprises (SMEs) make up the majority of businesses in Cambodia (only 0.2 % are companies with at least 100 employees; 98% of companies employ 10 people or fewer) and provide around two-thirds of the country's employment.

Through addressing some of these challenges and opportunities, there is potential to accelerate climate action with the private sector through PPPs.

4.3.2 Mitigation

In general, all mitigation sectors require strong public and private sector collaboration to ensure effectiveness. Based on existing climate related data and information available, the private sector is predominantly involved in the industry, waste and energy sectors, while less information is available for other sectors, namely transport, forestry, and agriculture.

[23] UNICEF EAPRO Climate Action Advocacy Development in ASEAN Region draft report

4.3.3 Adaptation

While the main potential to scale up private investments relate to mitigation efforts, barriers can be removed in order to stimulate private sector adaptation engagement, not least in the agriculture, human health, and fisheries sectors[24].

In all sectors, and crucially in buildings and infrastructure, it is in the interest of the private sector to be involved in policymaking and planning and to ensure guidelines and standards are appropriate and implementable. Private sector players are equally involved as input and technology providers (such as in innovative and more resilient clean energy, agriculture, and water spaces), as service providers (such as in eco-tourism or technical assistance to sectors such as water) or as financiers to many other actions, or can themselves be involved in awareness, training and education, such as through private media and universities.

5 Governance and Implementation Processes

5.1 The NDC update process

The Department of Climate Change (DCC) of the GSSD led a preliminary assessment of the NDC implementation and identification of gaps, as well as the development of the corresponding NDC Roadmap and Stakeholder Engagement Plan. This ensured that the country was able to review her NDC targets by the COP 26 meeting and is expected to achieve her stated contributions by 2030.

The process for the formulation of the NDC roadmap allowed for an initial engagement of stakeholders in key sectors in the discussion of which resources and mechanisms could be leveraged and what would still need to be put in place to ensure full delivery of the NDC targets. The NDC Roadmap, with expected timelines and targets for Cambodia's NDC implementation, as emerged from the process detailed above, is presented below.

[24] Source: NCSD (2016)

Cambodia's Updated Nationally Determined Contribution (NDC)

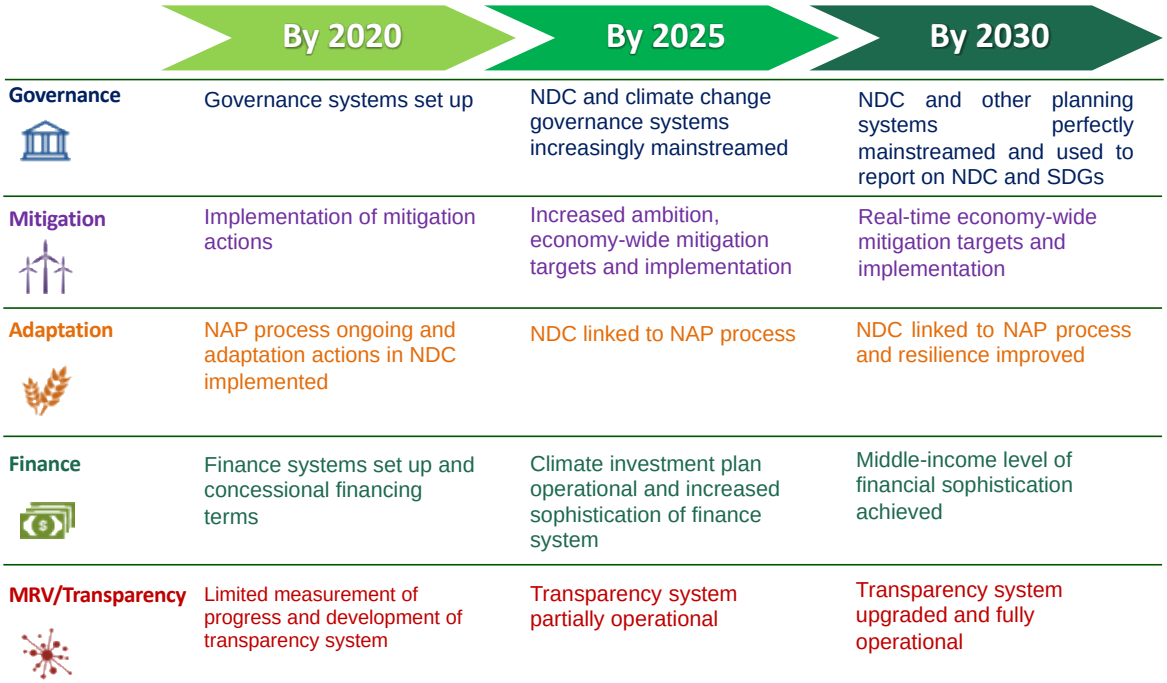


Figure 11 Summary of the NDC implementation timeline and targets

Source: NDC Roadmap (2019)

The NDC update process initiated with the line ministries in March 2020 helped ascertain whether certain targets would need to be adjusted and whether Cambodia would be able to raise her level of ambition. Strong engagement continued throughout the process: experts from development partners, including UNWOMEN, FAO, UNDP, UNICEF, World Bank, GGGI, and WHO provided specialist advice both to line ministries and inputting directly in this document. In addition, a private sector event was organised, with wide participation of stakeholders from different sectors, and local communities and indigenous peoples have been engaged in the process. Every effort was made to conduct such consultations in a gender responsive way.

5.2 Overarching policy structures

Cambodia's NDC places strong focus on the CCCSP 2014-23 (2013) and related Sectoral Action Plans for its implementation, in addition to the following, some of which have been developed since 2015:

- Cambodia's Sustainable Development Goals (CSDGs) 2016-30 (2018) have been developed, adapting the global SDGs to Cambodia's context by adding 'Goal 18 of De-mining' and tailoring the indicators

- The National Strategic Plan on Green Growth (NSPGG) 2013-2030 (2013) was prepared to move Cambodia towards a green economy
- The Rectangular Strategy IV (2018) was developed, focusing on fostering socio-economic development
- National Strategic Development Plan (NSDP) 2019-2023 was developed. There are four climate change indicators in the current NSDP. The line ministries will be required to develop their own sectoral development plans; and
- The Circular Economy Strategy and Action Plan is also being advanced. This outlines the key vision, mission, strategies, and roadmap for Cambodia to transition towards a circular economy through the improvement of many aspects of the economy and society.

In addition, there are a number of other sectoral policies and strategies, detailed action by action in the Annexes, including the below:

- National Protected Area Strategic Management Plan 2017-2031 (2017)
- National Cooling Plan (draft)
- National REDD+ Strategy 2017 – 2021 (2017) and the National REDD+ Action and Investment Plan (2019)
- National Energy Efficiency Policy (draft)
- National Environmental Strategy and Action Plan 2016–2023 (2018); and
- Strategic Planning Framework for Fisheries 2010 – 2019 (2010).

5.3 Stakeholder roles and responsibilities

The **NCSD** is the focal point for the UNFCCC, in addition to covering a number of other roles. The DCC/GSSD has played a key role in coordination within the government, integration into planning and budgeting, in addition to capacity building and overall stakeholder engagement across all sectors. The NCSD promotes sustainable development aimed at ensuring economic, environmental, social, and cultural balance within the Kingdom of Cambodia. It also includes an Executive Committee and a Secretariat (housed at the Ministry of Environment).

A **General Secretariat (GSSD)** was established to support the operations of the NCSD and for coordinating the development of policies, strategic plans, action plans, and legal instruments concerning sustainable development, including the green economy, climate change, biodiversity conservation and biosafety, and science and technology.

The **Department of Climate Change (DCC)** is under the GSSD and has led technical efforts for climate change adaptation and mitigation response and reporting.

A **Climate Change Technical Working Group (CCTWG)** was established to facilitate and provide technical support to the National Council for Sustainable Development (NCSD) in addressing climate change in the Kingdom of Cambodia. The TWG is key to governance and to ensure decision making and implementation by key line ministries.

Committees or technical working groups have been created in several line ministries to take on the coordination responsibilities for climate change actions within their respective sectors.

Civil society is recognised as an important voice for the community and plays an important role in policy implementation. The **NGO Forum** is one way in which civil society can bring a voice to the NDC formulation and implementation. Development partners also provide a platform for NGO collaboration and women-focused NGOs were consulted during the process of this NDC update.

An illustration of the roles and responsibilities of each stakeholder in relation to the NDC implementation can be seen in the following table.

Table 12 Roles and responsibilities of stakeholders

Stakeholder	Role and functions in NDC implementation
NCSD	• Coordination and integration • Capacity building and knowledge management • Stakeholder engagement
MoP, MoEF	• Support to integration of NDC implementation in national and subnational planning and budgeting • Support to MRV development and implementation
Line ministries/Government Institutions	• NDC planning and implementation in respective sectors • Provision of information to NCSD

NGOs	• NDC implementation • Provision of information • Provision of support • Engagement in policymaking • Representation of vulnerable groups
Private/finance sector	• NDC implementation • Engagement in policymaking • Provision of information
Development partners	• Provision of support • Engagement in policymaking
Academia	• Provision of research, development, innovation, and information • Engagement in policymaking

Source: NDC Roadmap (2019)

Stakeholders are represented in the following organogram.

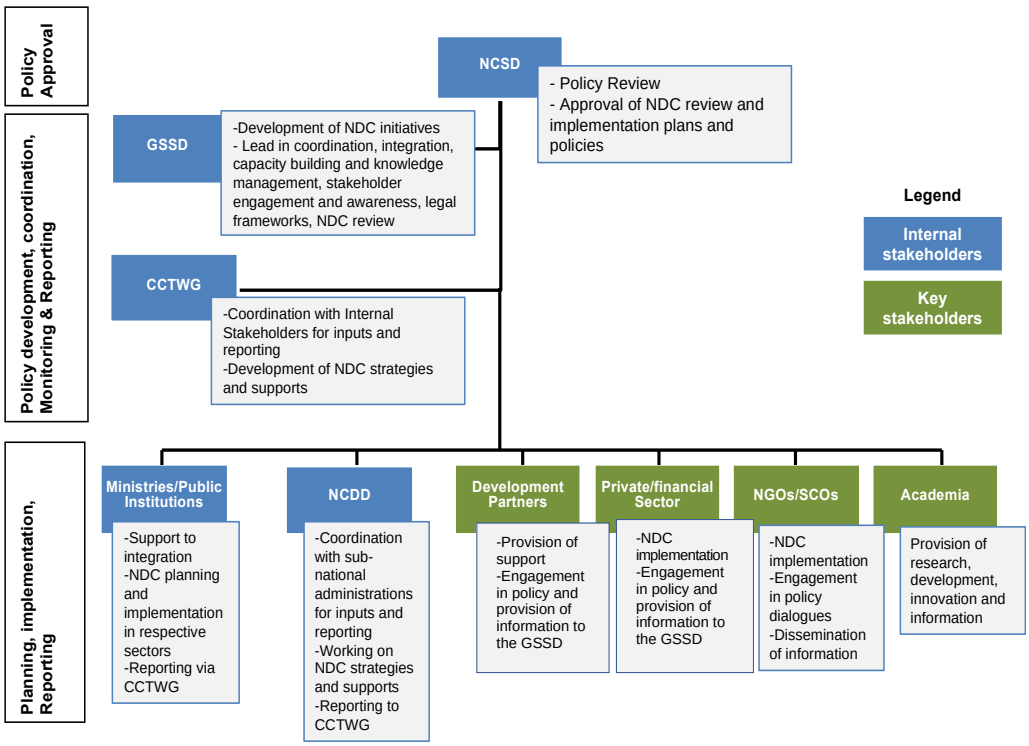


Figure 12 Stakeholder roles and responsibilities

Source: NDC Roadmap (2019)

7 Means of Implementation

This section presents an overview of the means of implementation across finance, capacity building, and technology.

7.1 Finance

Despite ongoing efforts, financial needs remain high and most actions require financial support (detailed actions are listed in the Annexes). Future resource mobilisation will look towards a reasonable mix of national and international funds, in addition to market mechanisms, where appropriate, and in line with progress on Article 6 of the Paris Agreement. The NDC Roadmap indicated that Cambodia will also require the development of a climate investment plan to aggregate finance needs, gaps, sources, options, and the creation of a project pipeline.

7.1.1 Mitigation

The following table summarises the finance needs per sector as reported by each ministry in their mitigation submissions. The total funding required for mitigation actions is over **US $ 5.8 billion.** The FOLU, waste, and energy sector mitigation actions require the most funds. These are mostly conditional upon international support. (Further information is provided in Appendix 4).

Table 13 Summary of mitigation finance necessary

Sector	Estimated finance necessary (million US $)
Agriculture	**49.4**
Energy	**672.1**
Forestry	**3,466.4**
Industry	**78.7**
Waste	**1490.3**
Transport	**10.6**
General[25]	**3.1**
TOTAL	**5,770.6**

Source: Ministries' submissions

[25] This row includes the estimated finance necessary for mitigation actions that cannot be included in the other categories (Energy, Waste, IPPU, Agriculture, FOLU), such as: 1) Promoting One Tourist, One Trees campaign; 2) Installing air quality monitoring equipment in all provinces across and establishing an air quality data monitoring center with mobile application for public information and access.

7.1.2 Adaptation

The table below summarises the finance needs per sector as reported by each ministry in their adaptation submissions. The total funding required for adaptation actions is just over **US $ 2 billion.** Infrastructure, water, and agriculture require the highest funding.

Table 14 Summary of adaptation finance necessary

Sector	Estimated finance necessary (US $)
Agriculture	**306,268,600**
Coastal zones	**72,000,000**
Enabling actions	**21,050,000**
Energy	**322,000**
Human health	**467,685**
Industry	**Not reported**
Infrastructure	**957,990,000**
Livelihoods, poverty and biodiversity	**211,125,000**
Tourism	**2,500,000 (as minimum)**
Water resources	**468,798,900**
TOTAL	**2,040,522,185**

Source: Ministries' submissions

Of the amount indicated above, the majority is conditional upon international support. In fact, almost half of the actions specifically included an indication of conditionality, whilst only five specified that implementation may be possible, at least partially, through existing budget allocations (see detailed table in Appendix 2). In any case, more analysis will need to be carried out as part of the NDC tracking process to ensure transparency.

7.2 Barriers and capacity needs

The NDC review identified the need for capacity building for the NDC implementation, especially for the NCSD/DCC, CCTWG, and sectoral (and sub-national) TWGs. In addition, each ministry submitted its own capacity building requirements. The table below summarises the barriers and capacity needs for the NDC implementation as submitted by each ministry and identified in the NDC review, the tackling of which will require strong international support.

Table 15 Barriers and capacity needs

Ministry	Barriers	Capacity needs
MISTI	• Technical capacity • Finance • Regulatory framework • Inter-ministerial cooperation • Participation from private sector (factory owners and workers) • Labour skill • Data from factories • Equipment	• Financial support • Human resource training • Support from top management
MLMUPC	• Finance (budget for activity implementation) • Climate change information toolkit and capacity • Data systems to monitor and evaluate the impacts of climate change interventions	• Capacity on climate change (otherwise MLMUPC has full technical capacity) • Support to strengthen the CCTWG of MLMUPC Capacity support for technical staff of the four General Department within MLMUPC as well as horizontal (line agencies) and vertical actors (sub-national government) in carrying out the activities.
MME	• Lack of regulatory framework • Limited capacity for data collection and monitoring • Lack of data management system • Lack of integrated decision support system	• Human and institutional capacity building • Financial support • Capacity on mainstreaming climate change into energy infrastructure planning and development • Integrated decision support system for integration of climate data (from various ministries) to support resilient energy infrastructure

MOE	• Climate model expertise
	• Concept note and proposal development
	• Data management and reporting
		As coordinator for the NDC implementation, the MOE would be expected to build its own capacity and the one of the line ministries in a number of areas, including:
		• Coordination and integration
		• Capacity building and knowledge management
		• Stakeholder engagement
		• Mitigation and adaptation including:
		  • Environmental, social, economic impact assessment
		  • ESS and gender implementation
		  • Sectoral knowledge and best practices
		  • GHG measurement and accounting
		  • Vulnerability assessment
		  • Policy development and appraisal
		• MRV/Transparency including:
		  • GHG measurement and accounting
		  • Negotiations skills
		  • Public financial management
		  • Database development

MOEYS	• Finance • Concept note development • Technical capacity	• Concept and case studies on climate change, DRR, climate emergency, response planning • Data collection and monitoring systems • Integration of climate change into school curriculum and teacher training curriculum, • M&E framework and systems for Education Management Information System (EMIS) and climate change.
MOH	• Finance for climate change infrastructure and innovation • Human resources • Gender involvement • Technical support	• Technical and financial support from external sources both for policy development, infrastructure and behaviour change communication and awareness raising
MOINF	• Finance • Technical • Human resources on climate change and environment	• Cooperation from stakeholders and expert ministries is crucial
MOP	• Finance • Capacity • Technical Assistance	• MoP has the capacity to guide sectoral ministries to implement their activities • Capacity building is necessary for all staff (by sector) on climate change • MoP and NCSD need capacity to assist in mainstreaming climate change in development plan. Being the key ministry to coordinate finance to the sectors, MoP might also require support in the following areas: • Financial and technology needs assessments • Financial modelling and cost benefit analysis • Business case and project concept note writing • Financial and investment terminology • Understanding of the constraints and requirements of investors • Accreditation and access to climate finance • Environmental, Social Safeguards (ESS) and gender
MOT	• Finance • Technical • Human resources on climate change and environment	• Cooperation from stakeholders and expert ministries is crucial
MOWRAM	• Finance • Capacity of staff • Needs assessment - particularly on technology	• Technical support and cooperation from the private sector is required

	• Data/information centres	
MPWT	• Finance • Human resource (capacity building) • Research and development	• Capacity on climate change to be built for implementation and access to finance
MRD	• Finance • Human resources	• Outsourcing some services to firms on project design and quality assurance • For the implementation of the Government budget, MRD have enough capacity to deliver
NCDD	• Capacity of implementers and NCDD • Finance • Policy (at the national level)	• Existing capacity is not yet sufficient for implementation. Climate change is still new • Human Resources are dedicated mostly for decentralisation and de-concentration, as reflected in the upcoming NCDD Strategy for 2021-2030
NCDM	• Resource person • Finance from development partners (governmental budget is limited) • Policy/standards (for example private engagement in DRM)	• NCDM would be able to deliver with technical and finance support
MOWA	• Capacity building to better understand the concept of gender and gender analysis, • M&E • Finance • Coordination (institutional arrangements)	• Resource person needs • Technical support • Gender safeguards mitigation measures implementation
MAFF	• Human resources • Finance • AFOLU GHG data • Technology	• Capacity building on Enhance Transparency Framework (ETF) and Management Information System(s) (MIS) • Technical support to establish and operate a tracking system for the NDC, CSDG and other relevant climate change strategies • Technical support for improving activity data and emission factor

Source: Ministries' submissions and NDC Roadmap (2019)

7.3 Technology needs and availability

7.3.1 Overview

Cambodia has developed a technology needs assessment for adaptation and mitigation. Technology needs also feature prominently in the sectoral climate change action plans.

However, these are mostly out of date, as such, each ministry provided an action by action indication of technology needs and availability (see the Annexes) and summarised here.

7.3.2 Mitigation

Limited information has been provided on technology availability in mitigation sectors. In waste, required technology is available in the country and region (e.g. Thailand, Vietnam, and Malaysia). In the energy sector, technologies such as Solar Home Systems (SHS), direct and alternating current (AC/DC) micro grids, and solar battery charging stations are available in the country. In the agricultural sector for example, compost technology is currently available. Key technologies in the transport sector include digital systems for GHG emission MRV; spatial planning tools for network management, including traffic management and newer technologies for electric mobility.

7.3.3 Adaptation

The agricultural sector indicated detailed technology needs for climate smart practices in all its proposed actions, ranging from stress tolerant varieties, to systems of rice intensification to integrated pest management and integrated soil and nutrient management. There are a number of innovative information platforms and databases in use for disaster risk management, including CAMDI (to monitor the impact of disasters, and the DesInventar package), real-time technology-based weather forecasting methods and technology transferred from the French and Finnish meteorological societies, in addition to manuals and toolkits such as the Community Based Disaster Risk Management Field Practitioners Handbook and the KoBo toolbox for community assessment. The energy sector continues to adapt renewable energy and energy efficiency technologies to the Cambodian context. The health sector makes use of a number of systems, such as the National Dengue Surveillance System, or the CAMEWARN, a case-based surveillance system which covers seven epidemic prone diseases and syndromes. The infrastructure sector makes use of several guidelines for climate proofing investment developed by the Asian Development Bank (ADB) and the World Bank. Technologies in use in the land use planning sector include land survey high technology, aerial photography for mapping, soil tests for spatial planning, downscaled climate projections and network-level vulnerability assessments. In the water resources sector, groundwater analysis, vulnerability and risk assessments, in addition to groundwater monitoring systems are in use.

7.3.4 Enabling technologies

The enabling sectors use a range of known technologies including radio, TV and social media for information and awareness to sharing lessons learned from other countries, or the National M&E Manual to monitor progress on indicators.

8 Transparency

8.1 Overview

The RGC's approach to developing and operationalising its domestic measurement, reporting and verification (MRV) systems focuses on integration into the existing climate change M&E framework structure of the CCCSP rather than setting up new layers of institutional structures.

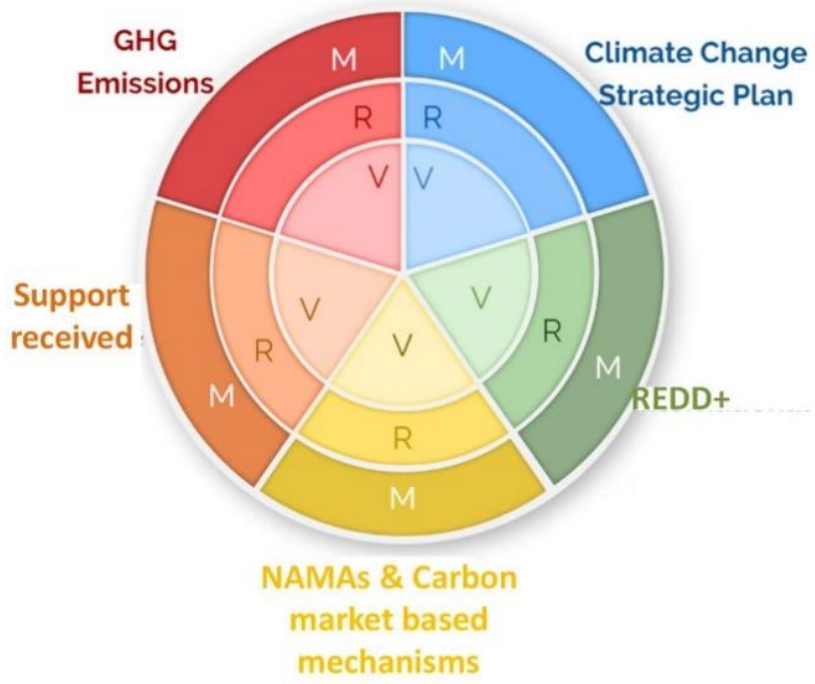


Figure 13 MRV systems in Cambodia

Source: NCSD (2020)

Cambodia has made significant efforts in establishing robust information systems for MRV. The country has five well-established MRV systems (GHG emissions, CCCSP, which includes adaptation and mitigation, REDD+, Project level MRVs for two planned Nationally Appropriate Mitigation Actions (NAMAs), 12 Clean Development Mechanism (CDMs), 6 Joint

Crediting Mechanism (JCMs), and 6 Verified Emissions Reductions (VERs) and Support received).

8.2 MRV for NDC Tracking

Cambodia puts great emphasis on the development of an integrated and detailed MRV system, which is also aimed at achieving the implementation of the NDC. It will be comprised of the following components (mitigation, adaptation, GHG inventory, support received, and support needed).

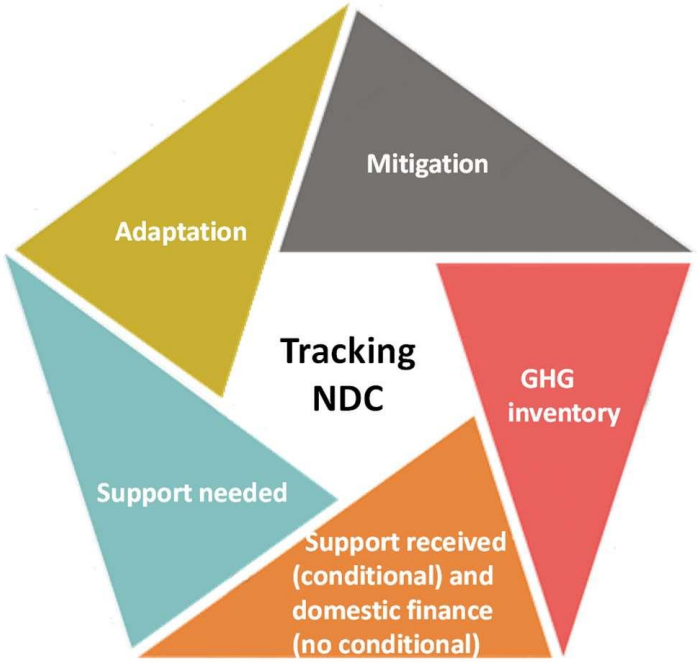


Figure 14 Components of MRV for NDC tracking

Source: NCSD (2020)

The system will detail how monitoring will happen, and how data will be managed, aggregated and translated into reports, with particular attention paid to gender and vulnerable groups. A simple, accessible and understandable **NDC tracking online system** will be developed and the tool will be made accessible online. It is expected that, to the extent possible, the system will harmonise and track all data needs for the relevant international agencies and domestic stakeholders. It will serve as a data repository for in-country stakeholders, including to provide knowledge management for the private sector and to track their contributions to the SDGs, and international ones, particularly the UNFCCC and

any other relevant international reporting agency. Verification from third parties, including academic institutions, will be considered.

The system will also consider the ISAF (accountability framework) supported by the NCDD (financed by the WB). This ensures proper accessibility of information at the community level (Information for Citizens I4C) and accountability at the commune levels to follow-up on the proposed measures.

8.3 Information to facilitate clarity, transparency and understanding

Information for the UNFCCC	
Timeframes	
Timeframe for implementation	2020-2030
Scope and coverage	
Scope of gases included in the contribution	Carbon Dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O)
Geographies covered by the contribution	All national territories
Assumptions and methodological approaches	
Methodology for estimating emissions and projections (Excluding the FOLU sector)	Historical Data: The reported estimates of emissions of GHGs and removal of CO_2 are based on data reported in the 2019 GHG Inventory Report and First Biennial Updated Report (BUR, 2020) developed by the Government of Cambodia. Tier 1 methodologies set out in the International Panel on Climate Change (IPCC) 2006 Guidelines and IPCC default emission factors and country specific activity data from 1994 to 2016 were used for the BAU assessment. Baseline Scenario: Projections were generated by forecasting the calculated emissions within the period of 2000 to 2016 using PROSPECT+ modelling tool for electricity, transport, buildings, cement, other industry (excluding cement), agriculture and waste sectors. Default emission factors and activity data were collected from a wide range of sources but focusing mainly on the latest update of BUR and the defaults values which were given by the model itself. All projections considered current macroeconomic conditions, policy conditions, market conditions and events in other sectors. For each sector, a BAU scenario was developed by extrapolating past emission trends, interpolating to fill data missing in a sequence and using relevant influential factors (GDP, population, forestry growth rate). Mitigation Scenario: These were formulated based on submissions from relevant ministries. All the possible

	mitigation actions were considered to develop the NDC scenario using PROSPECT+ model.
Approaches for land use, land-use change and forestry emissions	EX-ACT tool was used for this sector because PROSPECT+ doesn't cover the FOLU sector. Historical Data: Most of the activity data was taken from the National GHG Inventory prepared in 2019 and the BUR finalised in 2020. Besides those, default values which are given by the EX-ACT based on 2006 IPCC guidelines were considered. (Data from 2000 to 2016 were used) Baseline Scenario: projections for the FOLU sector were generated by calculating emissions within the period of 2000 to 2016 using EX-ACT. Then the BAU forecasts were developed based on the forest cover percentage and deforestation rates in the country. Mitigation Scenario: These were formulated based on proposed actions submitted from all relevant ministries. The main FOLU sector targets were considered to developed mitigation scenarios.
Global Warming Potentials (GWP)	GWP values used for estimating CO_2e were taken from the IPCC Fourth Assessment Report to be in line with the latest updated BUR submitted in 2020
Reference point	
Business as Usual (BAU) emissions in the target year	Selected BAU scenario: 213 million tCO_2e/year for the year 2030
Projection methodology for low carbon scenarios	PROSPECTS+ model was used to estimate baseline and NDC emissions for sectors other than the FOLU, and EX-ACT tool for the FOLU sectors. Most of the activity data were taken from the 'National GHG Inventory 1994-2016' prepared in 2019 and a study on "A Design of Low Carbon Development Plan Towards 2050 in Cambodia in 2016".

8.4 Fairness and ambition

The core mitigation commitments of the Paris Agreement are common to all parties, but there is some differentiation in requirements. Developed countries "*should*" undertake absolute economy-wide reduction targets, while developing countries "*are encouraged*" to move toward economy-wide targets over time. Cambodia, despite being a least developed country, with an eighth of the per capita emissions when compared to the global average[26], sets, in this updated NDC, ambitious sectoral reduction targets and structured and comprehensive adaptation actions.

26 Source: The World Bank, CO_2e emissions per capita global database. Estimates for 2016.

9 Sustainable Development

Climate change mitigation and adaptation will be crucial not only to achieve SDG 13 on Climate Action, but a number of other SDGs, in addition to the Paris Agreement and given the cross-cutting nature of climate change. SDG 13 has significant implications on the achievement of other key priorities of each country, such as poverty reduction, food security, gender equality, water and sanitation, energy access, reduced inequalities, sustainable cities, and sustainable land use and ecosystems[27]. As such, the NDC implementation can contribute to almost all SDGs, and gender sensitive approaches can help redress gender inequalities (SDG5) and ensure women are engaged and can benefit at all levels.

As part of the Cambodia NDC revision process, an analysis on how the NDCs can impact the achievement of the SDG was carried out. Each mitigation measure and adaptation action was screened against the attainment of the SDGs. For mitigation, the SCAN tool was utilized.

Given the overlap between the SDGs and climate change action, the MRV/Transparency systems used for the NDC implementation can potentially be used to track the SDG implementation as well, especially the goals related to mitigation, adaptation, and finance. They could also be used to track the gender sensitive impact of climate actions and effectiveness of gender mainstreaming initiatives if appropriate gender indicators are embedded into the M&E framework and appropriate resources and monitored.

27 Source: CDKN (2019)

Table 16 Summary of the SDG assessment of mitigation actions

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
Industry			
Urban planning tools for climate change mitigation and the urban planning solution in three sub cities	MLMUPC	Air pollution reduction,	
Improvement of process performance of EE by establishment of energy management in buildings/industries	MME	Training of a certain number of energy managers/companies by DTEBP	
Efficiency energy and pollution management in latex and rubber wood processing	MAFF	Energy saving, reduce GHG and pollution from waste water, health and environment friendly, increased income and value added and employment, and safety working environment	
Waste			
Development of strategies for waste management including hazardous waste management (MISTI focuses on technical aspect of waste management inside the factories; Improve process only)	MISTI		
New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill Potential for private sector engagement in financing, constructing, and operating sanitary landfill and LFG systems	MoE	Reduced fire hazard - Decrease risk of collapse - Odour control - Reduced health hazard - Energy for leachate evaporation -Prevention of surface and groundwater contamination from toxic waste components	

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
		- leachate capture and treatment - Employment creation	
Bio-digesters construction (85% reduction compared to 2000)(Small size (2-3-4m3); Medium size(6-8-10m3), Large size(>10m3)	MAFF	Contributing people's livelihood as well as better economy	
Composting of biodegradable organic fraction of MSW supplemented with separation of organic waste (at source). Can be done at different stages in the waste management value chain, either at household, community level or at landfill site. Private sector can invest in and operate the composting facilities	MoE	Job creation -Reduced odour nuisance- local organic fertilizer production-less leachate leakage from landfill-less landfill space required, so cost-savings (but space required for composting)	
Production of Refuse-Derived Fuel (RDF) from either a) fresh MSW or b) old MSW mined from the Dangkor landfill. The mechanical and biological separation and treatment of waste will be combined with an anaerobic digestion plant (generation of biogas from organic waste) to power facilities at the landfill. The produced RDF can be sold to e.g. cement industry as fuel. Private sector can invest in and manage the RDF and anaerobic digestion plant	MoE	1. Job creation 2. Reduced odour nuisance 3. Local organic fertilizer production (bioslurry) 4. Less leachate leakage from landfill 5. less landfill space required	
Implementation of National 3R strategy	MoE	Achieving a recycle process with an environmental and economic purpose contributes to the goal of the environment and sustainability	

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
Centralized recycling facility for industrial waste from the garment sector	MISTI	Provides job opportunities for landfill pickers in a safer environment-Reduces energy costs and Provides a more comfortable environment for the occupiers of The buildings equipped with insulation-Improves local air quality by reducing The open burning of garment waste, including at The landfills-Reduces The need for landfill space-Reduces The need of virgin materials for manufacturing building products	
Energy			
Application of electrical equipment labelling & MEPS (Lighting, Cooling & Equipment)	MME	Labelling and standard product information of the consumption of energy	
Public awareness campaigns, DTEBP-EE info centers	MME	1. Reducing inefficient appliances/technologies uses 2. Informing the citizens of possibilities to improve EE and of related benefits	
Building codes and enforcement/certification for new buildings and those undergoing major renovation	MME	Energy efficiency standards, laws and regulations concerning building energy codes are being elaborated and promulgated	

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
Introduction of efficient electrical industrial motors and transformer	MME	Resolve of economic viability of investing in the improvement of energy efficiency of the equipment	
Improve sustainability of charcoal production through enforcement of regulations	MME	Forest fire prevention and biodiversity protection	
Increase energy access to rural area	MME	Local community has electricity 24 hours	
Incorporate renewable energy resources (solar, wind, hydro, biomass) into energy mix	MME	Reduce imports energy sources and increase clean energy	
Diversification of household and community energy generation sources to reduce reliance on biomass as an energy sources	MME		
Reducing GHG emission though off grid street lightening of rural municipality	NCDD	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission b) NCDD will also implement ESS, Gender, M&E along with climate action	
Toward Battambang city to green city	NCDD	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG	

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
		emission) NCDD will also implement ESS, Gender, M&E along with climate action) Paradigm shift	
Cooling of public sector buildings	NCSD	The cooling of public buildings has many benefits, including: • Reduced GHG emissions – climate-friendly solutions to cooling buildings reduces the reliance on ACs which are a source of GHGs • Improved living conditions – as temperatures rise, cooling of buildings in a necessity to avoid heat stress and the subsequent health risks	
Promote sustainable energy practices in manufacturing	MISTI	Improving energy productivity, reducing ambient temperatures through ventilation and cooling optimization and decreasing fugitive heat losses from steam and compressed air delivery systems	
1: Sustainable energy practices in garment industry 1.1: Upgrade to efficient boiler 1.2: Sewing machine 1.3: Washing machine 1.4: Drying machine 1.5: Compressors 1.6: Efficient lightning appliance			
2: Sustainable energy practices in brick industry 2.1: Boat-to-rotary kiln upgrade 2.2: Modified boat-to-rotary kiln upgrade		Improving brick kiln efficiency can improve the safety of brick kiln operation through implementation of better safety features that reduce risk of injury during loading of fuel and handling of bricks. Reducing	

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
		the toxicity and amount of emission pollutants coming from brick kilns is also an expected benefit to implementing energy efficient technology.	
3: Sustainable energy practices in food & beverage Industry 3.1: Replacing inefficient boilers in the F&B industry		Improving energy productivity, reducing ambient temperatures through ventilation and cooling optimization and decreasing fugitive heat losses from steam and compressed air delivery systems	
4: RECP practices in the manufacturing industries 4.1: Replace an LPG fired boiler consuming about 704,428 L/year with a biomass-residues fired boiler in a Food Import and Export company 4.2: Replace a diesel-fired dynamo with grid electricity at a milling factory; the diesel dynamo is consuming 12 liters/hour operating for 8 hours/day, 20 days/month 4.3: Improve operations at a noodles manufacturing unit to reduce the usage of one boiler from existing four-boiler system 4.4: Install a system to collect and re-use waste steam and hot water from meat steamer, resulting in about 524 m^3/year of fuel wood saving			

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
Transport			
Promote integrated public transport systems in main cities	MPWT		
Enhance maintenance and inspection of vehicle(Piloting maintenance and emission inspections of vehicles)	MPWT	1. Reduce maintenance cost/saving cost 2. Reduce traffic accident, injury and fatality 3. reduce air pollution 4. reduce GHG emission5. innovate technology	
E-mobility	**MPWT**		
Establish green belts along major roads for climate change mitigation	MPWT		
Shift long distance freight movement from trucks to train	MPWT		
Agriculture			
Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)	MAFF	Sustainable land management, reduce emission from burned agriculture residue, protect soil from erosion	
Organic input agriculture and bio-slurry; and deep placement fertilizer technology	MAFF	Reduction of chemical fertilizer utilization, contribution to mitigate the greenhouse gases, reduce production cost and pollution, and soil improvement	

Mitigation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
Promote fodder production to improve high nutrient rich and high-quality forage feed value agriculture by-products technology to support cattle production	MAFF	Increase soil organic carbon, Enhanced adoption by farmers of improved fodder technology has significantly increased animals' production and household income	
Promote manure Management through compost making process to reduce carbon emission	MAFF	Increase GAHP "Good Animals Health Practice" enhanced adoption by improving animal farms and slaughterhouses; household	
Seedlings distribute to public and local community	MAFF	Contributing forest cover, promote CF livelihoods, and cultural	
Forestry			
FOLU: Reduce 50% of historical emission by 2030	REDD+ Technical Secretariat (RTS)	Combating the climate change and promoting people's livelihood	

Table 17 Summary of the SDG assessment of adaptation actions

Adaptation action	Ministry	Co-benefits (environmental, social, adaptation)	SDG contribution
Agriculture			
Towards an Agroecological transition in the uplands of Battambang	NCDD	a) Climate Change mitigation as the project considering of low-carbon agricultural technology b) Improved new management approach in agroecosystem c) NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	
Development of Rice crops for increase production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement	MAFF	Promote climate-friendly Agri-business rice value chain and profit in rice production value chains. Mitigating impact of rice farming on environment	
Development of Horticulture and other food crops for increase production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement	MAFF	47.1% of youth who involved in agriculture sectors, will be provided capacity development, technology transfer in various form of sustainable agriculture including Climate Smart Agriculture (CSA), Sustainable Rice Platform (SRP) and Good Agriculture Practice (GAP). Youth will be strongly involved in pre and post-harvest technology, and Agriculture Cooperative (ACs), Enterprise development and other agro-business enhancement to ensure	

		food security and income generation among the youth groups.	
Development of Industry crops for increase in production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement	MAFF	Promote climate-friendly Agri-business value chain and profit generation boosting local food security through diversification, reduction in soil degradation and greenhouse gas emissions through fostering eco-system services through CSA practices.	
Improvement of support services and capacity building to crop production resilient to climate change by promoting research, trials and up-scaling climate-smart farming systems that increase resilience to CC and extreme weather events	MAFF	Increasing resilience to climate change and natural disasters, and improving resilience facilities, tools and technologies.	
Building climate change resilience on cassava production and processing	MAFF	Mitigation: reduce pollution from processing Environmental: Prevent soil erosion Social: healthy living conditions for people in the cassava production areas	
Research for the development and enhancement of agricultural productivity, quality, and transfer through strengthening of crop variety conservation and new crop variety release responding to the impacts of climate change	MAFF	Promotion of environment and conservation of natural resources	
Development of new technologies and increased yields by using new crop varieties which adapt to climate change	MAFF	Promotion of environment and conservation of natural resources	

Development of rubber clone varieties suitable for AEZ and resilient to climate change	MAFF	Maintain and improved rubber production and provide employment; Improvement of rubber plant genetic and fully scientifically documented; Increased revenue by reduced maintaining cost; Mitigation as rubber plantation requested CO_2e Economic growth	
Enhancing institutional and capacity development on climate change impact, vulnerability assessment, adaption measures and mitigation related to rubber sector	MAFF	Sustainable rubber production to support economic development and employment	
Improvement of animal breeding technology in Cambodia through Artificial Intelligence (AI) which can adapt to climate change	MAFF	Environmental, social and adaptation	
Promotion of research capacities on animal genetic, animal breeding, and animal feed is strengthened to adapt to climate change	MAFF	Environmental, social and adaptation	
Strengthening capacities for risk prevention and reduction, effective emergency preparedness and response at all levels; enhancing livestock and disease-related early warning system, and integrating disaster risk reduction and climate change adaptation measures into recovery and rehabilitation initiatives in the livestock sector	MAFF	Environmental, social and adaptation	
Promoting aquaculture production systems and practices that are more adaptive to climate change	MAFF	Develop aquaculture system increase production, enhance livelihoods related to food and nutrition security, reduce fishing pressure on fisheries resources	

Promoting climate resilience in the capture fisheries sector	MAFF	Develop fishes and aquatic habitats, sustain fish yields, strengthen food and nutrition security	
Scaled up climate-resilient agricultural production through increased access to solar irrigation systems and other climate-resilient practices	NCDD	a) GHG emission reduction through solar irrigation b) NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	
Developing a training manual and providing training on approaches for development of climate-smart and sustainable livelihood to rural poor people	MRD	-Adaptive capacity of rural poor people will contribute to livelihood promotion and be environmentally friendly	
Coastal zones			
Protection, risk mitigation, and resilience building from marine pollution particularly caused by activities on land including marine pollution from waste and aquaculture activities.	MoE	Mitigation: reduce GHG emission from waste in oceans	
Effective management and protection of ecological systems of marine and costal zones to avoid adverse impacts from various factors, build their resilience and restore its functions for productive and healthy oceans	MoE	Biodiversity of marine resources	
Energy			
Conduct climate risk analysis for the existing electricity infrastructures and provide recommendations	MME	a) Forest fire prevention and biodiversity protection b) Local community safety and life protection c) Water and air pollution	
Climate proofing of existing and future solar/hydropower infrastructure	MME		

Human Health			
Enable effective decision-making for health interventions through generation of information and improved surveillance or early-warning systems	MOH	- Social: improve health care system and enable remote village to have proper access to healthcare -Indirect: reduce risks of life-lost and losing money on long-distance travel to healthcare - To reduce of time lag on reporting number of cases to the National Level - Reduce diagnostic errors	
Enhance climate resilience in health service delivery	MOH	- Community has better planning to maintain a reliable, safe supply of water, sanitation - Community hygiene can prevent diseases as-well-as can lower death rates - Improving quality of care through water, sanitation and hygiene in health care facilities - Reduce environmental pollution through proper waste management	
Strengthen and provide capacity building of technical guidelines for diagnosis, detection, control, prevention and treatment of vector-borne and water-borne diseases, injuries and other food poisoning illnesses arising from climate change	MOH	Capacity for health professionals improved to identify and treat climate-sensitive health issues	

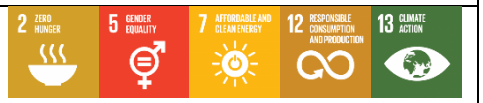
Conduct water sanitation and hygiene (WASH) assessment on climate change and develop planning for communities and health facilities.	MOH	Population	
Strengthen institutional capacities to effectively integrate climate risks and adaptation options in health sector planning and implementation	MOH	Capacity of health personnel improved to identify and treat to climate-sensitive disease	
Industry			
Integrating climate change response measures onto the construction design for buildings and for rural housing (use of modern integration of technology)	MLMUPC	1) Stakeholders (designer, user, and building commercial owner) are aware of the risks and potential impacts of environment posed by variability in weather patterns and observed and projected climate changes on the different types of building construction 2) Environmental Risk Management and Mitigation is created because the construction equipment operations consume a lot of natural resources, such as electricity and/or diesel fuel. 3) The measure includes enacting strict laws to enforce institutions to make environmental impact assessment (EIA) in the early stage of projects, and enhancing the awareness of construction participants with regard to impacts of construction in the environment	

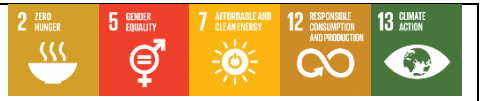
		The results also revealed that "search about alternative methods for construction to mitigate the adverse impacts of construction on the environment" was ranked in the second position with regard to proposed solutions to mitigate the environmental impacts of construction.	
Develop resilient infrastructure of school buildings in response to climate change	MOEYS	a) Energy saving b) Low carbon building c) Strengthen school capacity to accommodate more students	
Implement climate change and disaster resilient construction and infrastructure standards including for public sector and community-focused buildings covering public health, education, WASH, etc.	NCDM	- Technical guidelines cross-beneficial to other sectors - Potential for community groups (e.g. school support committees) to be involved in construction/retrofitting - Increased energy-efficiency, and use of climate-aware products	
(DLUP) Prepare spatial planning (city/district/municipality) guidelines at all levels for climate change adaptation (CLUP) Integrating climate change response measures to the commune land use planning	MLMUPC	Enhance terrestrial, aquatic resources of each ecosystem of the commune and district location to preserve and conserve environmental degradation (35% of total commune land are green spaces) and enhance social stakeholder to participate the during road map design and CLUP/DLUP study	

Integrating climate change response measures to the policy of social land concession (SLC) and its procedures	MLMUPC	The country's land poor and landless families have received land, have improved their livelihoods via land allocation, and land recipients have capacity to challenge with climate change impacts because they have been trained and educated on climate change. On the other hand, allocated land to people to use for their farming creates soil fertility	
Prepare modality of standardized green spaces for urban planning or new sub-cities to address vulnerability of urbanization.	MLMUPC	Mitigation co-benefit: contribution to the local GHG emission Environment co-benefit: ecosystem restoration (i.e. regulate water) Social co-benefit: job creation, improved public health	
Vulnerability assessment towards the development of climate change strategic plans to respond to the impacts on land, housings, coastal management, and building due to climate change	MLMUPC	Contribution to climate data related to cities through finding of the assessments	
Promote land use planning tools for urban houses and building construction adaptive to climate change benefits to the low-income and homeless people	MLMUPC	The project will produce low-carbon emissions to enhance environmental atmosphere Social co-benefit: build assets (housing) for low income and homeless people	
Promote proper low-cost shelters for low-income households resilient to climate change, practically in the area of social land concession	MLMUPC	The project will produce low-carbon emission that is to enhance environmental atmosphere Social co-benefit: reduce land	

		conflict, improve livelihood of beneficiaries through provision of low-cost shelters in the areas of social land concession	
Development of building code with mainstreaming climate change into building designs	MLMUPC	Energy consumption in building sectors Reduction of GHG in atmosphere Promote low-cost materials for building and housing Improve health and safety of city inhabitants	
Mainstream climate change response measures into coastal development planning against sea water intrusion, sea water rise and seasonal storm destruction, and rising temperature	MLMUPC	Promote sea engineering environment, sea water rise, sea tidal hazard, seawater intrusion and sea erosion Disaster management to protect coastal populations	
Strengthening climate resilient city	NCDD	Strengthen knowledge and capacity on resilient city. Financing for resilient cities. Partnership and communication.	
Develop national road construction and maintenance design standards for national and provincial roads, considering climate change impact including M&E framework develop for climate proofing and low-carbon technology roads	MPWT	Reduce road repair/ rehabilitation cost Reduce vehicle maintenance Save time Ensure flow of traffic and transportation	

Repair and rehabilitate existing road infrastructure and ensure effective operation and maintenance systems, considering climate change impact	MPWT	- GHG mitigation using low carbon technology road - Building road with less impacts on forest, biodiversity - Planting tree along road and highway to reduce heat and emission produced by road - Ensure sustainability of water run-off for the intersection of water way and road line	
Rural road rehabilitation and improvement for climate change resilience	MRD	- Contribute to GHG reduction - Food Security, - Agriculture market connectivity, Skill development, - Improve productivities	
Livelihoods, poverty and vulnerability			
Develop and annually update national and subnational multi-hazard and climate risk assessments, including identification of most vulnerable communities.	NCDM	- National risk assessment can be used as a basis for priority areas of adaptation and mitigation activities - Enhanced database on disaster occurrences in Cambodia - Being an instrument in monitoring disaster impacts across the country; can be used to informed priority areas and actions on mitigation activities. - Can be used alongside ID Poor system	
National end-to-end Early Warning Systems with focus on effective dissemination to populations at risk	NCDM	Other sectors, i.e. water resources and meteorology, agriculture will be of benefited by potential cross-sectoral mitigation activities.	

Implement community–based disaster and climate risk management programs	NCDM	- Social resilience at community level and increased engagement in disaster preparedness and response - Reduced asset, infrastructure, and life loss due to disasters	
Building resilience of biodiversity conservation and restoration to adapt to climate change	MOE	Environment	
Integrated village development	MRD	- Job creation - Food security - Behaviour Change - Better living environment - Wellbeing and environmental friendliness of communities to improve	
Strengthen flood resiliency capacity of communities around Tonle Sap (access to clean water, off grid renewable energy, and waste management)	NCDD	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission though reducing fire wood consumption and waste pollution. b) Strengthen resilient capacity of women and girl in flooding community though accessing to clean water and clean energy. NCDD will also implement ESS, Gender, M&E along with climate action	

Building climate resilient livelihood and public infrastructures in social land concession for vulnerable communities	NCDD	Modality: the project designed as potential for scaling up through its key success of implementation. It would be the key recommendation for the improvement of social land concession implementation to include climate change as one of main focus while community will really need support to cope with such climate change issues when settle-in new development area of social land concession sites. Improve knowledge: the project will help to improve understanding for sub-national level, local authorities on climate change both of adaptation and mitigation though join implementation follow decentralize approach under coordination of National Committee for Sub-National Democratic Development Secretariat (NCDDS). Similarly, the community groups will also receive training and awareness raising to build their sense understanding climate change to engage fully participation for the project implementation. This will positively contribute to both of adaption and mitigation action in the future.	

Tourism			
Provide capacity building and supports for climate change innovation at the provincial along Tonle Sap River	MOT	Encouraging all involvement tourism stakeholders for better the understanding and to engage their contribution on adaptation to two beneficiaries: 1) Environmental Education Development on green tourism, 2) Peam Krosoap was estimated be upgrade and innovated for climate change adaptation. Cambodia CBET/CET standard, 3) The quality of ecotourism services and products would improve through by tourism innovation. 4) Reducing poverty and contribute to responding effectively to climate change, so it is increasing the gross domestic product of Cambodia (GDP).	
Raising public awareness on climate change innovation at all levels	MOT		
Practicing smart agriculture in tourism sector	MOT		
Water resources			
Establish an automated nation-wide hydromet monitoring network and data transmission program, including collection of climate and hydrological data	MOWRAM	Data can be used cross-sectorally and for short- and long-term projection Supporting disaster risk reduction,	

		and other mitigation activities Supporting River Basin management planning and monitoring activities Supporting hydrological modelling works and decision support system (DSS)	
Establish a centralized and standardized approach to climate-resilient water management	MOWRAM	Improved relationships between all major water users Improved water allocation and abstraction limits -> reverse/halt overdevelopment impacts Protection of environmental flows as the support of basin human needs and ecosystem	
Establish a national climate and flood warning system, including a service centre and flood emergency response plans	MOWRAM	Other sectors, i.e. agriculture will benefit by potential cross-sectoral mitigation activities Flood risk reduction and mitigation	
Integrated groundwater management in Cambodia	NCDD	a) Sustainable water management b) Reduce water pollution c) NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	
Establish nationally standardized best -practice systems for irrigation	MOWRAM	Improved relationships between all major water users Increased productivity of agricultural sector	

		Improved water allocation and abstraction limits and reverse/halt overdevelopment impacts Protection of environmental flows as the support of basin human needs and ecosystem Increased drought management	
Resilient and adaptive rural water supply and sanitation construction	MRD	Changing attitude and practices of rural people to be more environmentally friendly	
Education			
Upgrading curriculum and training methodologies, including libraries, to include climate change subjects for primary schools	MOEYS	Students shall understand: a) climate change mitigation b) Pollution c) Biodiversity d) Environment conservation e) 5Rs	
Upgrading curriculum to include climate change for non-formal education	MOEYS	Students shall understand: a) climate change mitigation b) Pollution c) Biodiversity d) Environment conservation e) 5Rs	
Build centres of excellence for delivering climate change courses and research among Universities	MOEYS	a) climate change mitigation b) Pollution reduction c) Biodiversity d) Environment conservation e) 5Rs	

Conduct training for education officials on climate change e.g. as a required component of teacher training	MOEYS	a) climate change mitigation b) Pollution c) Biodiversity d) Environment conservation e) 5Rs	
Gender			
Strengthen institutional capacities at national and sub-national levels to integrate gender responsiveness in climate change adaptation's policies, plans, programming, including gender budgeting	MOWA	Improve gender equality, Gender responsive action, Gender responsive budgeting in policies planning of action and programmes	
Enhance coordination and implementing accountability mechanisms to reduce climate change vulnerabilities of disadvantaged women and other marginalized groups such as ethnic minority women and men, People with Disability (PWD), youth, and elderly	MOWA	Increase collaboration with Ministries, institutions, civil society, development partners and the private sector in an efficient and accountable manner Extending the scope of partnership building Increase the family economy, food and nutrition Security	
Enhance monitoring and evaluation systems of sectoral ministries to track gender outcomes in climate change initiatives with particular focus on collecting and managing sex-disaggregated data, gender indicators and budgeting, outcome-based reporting, and dissemination and up-scaling of the gender and climate change adaptation related knowledge generated.	MOWA	- Gender Responsive M&E - Reducing Gender Gap in social environment	

Capacity development for GCCC members and sectoral ministries on Gender analysis, gender responsive and NDC	MOWA	Capacity development Promotion of gender in social inclusiveness Reduction of gender gap in social environment	
Develop a technical guidelines for gender mainstreaming in NDC process	MOWA	Mainstreaming gender and social inclusion in NDC Analysis of gender integration in NDC (both adaptation and mitigation)	
Market supply chain of rural women entrepreneurs resilient to climate change	NCDD	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission b) NCDD will also implement ESS, Gender, M&E along with climate action c) Builds market capacity of rural women entrepreneur in the context of climate resilient and DRR	
Governance			
Local government and Climate Change-III (LGCC3)	NCDD	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission b) NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards c) Create enabling environment for local solution to address climate change	
Reducing vulnerability of local communities though sub-national climate governance reform (focusing on policy)	NCDD	a) NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	

		b) Create enabling environment for local solution to address climate change	
Information			
Enhance the quality of broadcasting means and expand the capacity of coverages for raising awareness on climate change nationwide	MOINF	- GHG mitigation - Environmental protection - Forest protection - Biodiversity conservation	
Training and enhancing human capacity on climate change in information sector	MOINF	- GHG Mitigation - Enhance journalistic professionalism - Reduce the spread of disinformation	
Urge private Media organizations to participate in covering/broadcasting the climate change topics and to complement the state broadcasting agencies.	MOINF	- Reduce cost of climate risk - informed society and active citizens - GHG Mitigation Environmental protection - Forest protection - Biodiversity conservation	
Urge and encourage to reduce (or ban) all forms of commercial advertisement that has negative impact on environment	MOINF	- Reduce cost of climate risk - GHG Mitigation Environmental protection - Forest protection - Biodiversity conservation	
Knowledge sharing			
News coverage and program production for awareness raising on climate change and its impacts	MOINF	- Reduce cost of climate risk - GHG Mitigation Environmental protection - Forest protection - Biodiversity conservation	
Policy and planning			

Building climate resilience for district and commune governance through policy and strategic development plan reform (Focus on implementation)	NCDD	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission b) NCDD will also implement ESS, Gender, M&E along with climate action c) Improve performance-based of sub-national government on climate change planning and accessing to climate resilient grants	
Mainstreaming climate change into Education Strategic Plan 2019-2023 Strategic Plan and SDG4 Roadmap for Education 2030	MOEYS	a) Climate change adaptation b) Policy, Planning & Guidelines, c) Strengthening d) Research enhancement	
Strengthen the cooperation with local and International development agencies, NGOs and relevant institutions for technical and financial support to implement the adaptation planning in media sector	MOINF	- GHG Mitigation - Environmental protection - Forest protection - Biodiversity conservation	
Development of climate change national/ capital/ provincial development plans including an M&E system with specific indicators	MOP	Climate change adaptation and mitigation and other environmental issues (air pollution, water pollution, waste management, biodiversity, etc.) will be integrated into a single plan	
Development of a climate change public investment program for the national/capital/ provincial levels	MOP	Mitigation investment plan Public awareness on climate investment and fund will be improved	
Building adaptive and resilient capacity for MRD officers at national and sub-national level for mainstreaming climate change into	MRD	Contribute to the improvement of rural development work in challenging environment	

rural development planning processes and technical design.			
Build adaptive capacity on climate change for village leaders (Village Development Committees, VDCs)	MRD	Contribute to rural community development planning and practices in challenging environment	
Strengthen resilience and adaptation capacity to climate change in the most vulnerable provinces/districts/communes (produce vulnerability index maps at the commune level, integrate climate change into investment and development plans, demonstrate the identified actions at pilot sites)	NCSD		
Update and implement the Cambodia Climate Change Strategic Plan (CCCSP) for 2024-2033	NCSD		
Integrate climate change measures into national policies, strategies and sectoral strategies and plans	NCSD		
Enhance institutional capacity on climate change (mitigation, adaptation, policy, strategies, planning, and finance) through awareness raising, training, and advocacy	NCSD		
Development of a long-term low emission strategy	NCSD		

Appendix 1: Detailed Mitigation Measures

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
1	**Urban planning tools for climate change mitigation and the urban planning solution in three sub city**	Industry	Ministry of Land Management, Urban Planning and Construction (MLMUPC)	Urban Strategic Policy 2020.	Three urban planning solutions will be implemented through the toolkit and formulated policy in the case area to reduce GHG emissions from earth construction, resulting in the saving of 2360 tons of CO_2	1. 70% of the three urban planning completed by 2025 (unconditional) 2. 100% of the three urban planning completed by 2030 (unconditional)	Air pollution reduction, independency in terms of energy generation, improve resilience of urban planning through access high technical motivation	1. Costs: for policy formulation is 2.5 million 2. Costs: for three urban planning solution is 25 million		Technology is available, but it needs to have complemented from international places	Job targets at least 32% of women	Conditional			5, 8, 9, 11, 12
2	**Improvement of process performance of EE by establishment of energy management in buildings/industries**	Industry	Ministry of Mines and Energy (MME)	Implementation of energy audit and enforcement of industries to adopt energy management standards	0.1 $MtCO_2e$/year	1. Conduct the mandatory energy audits for companies with an annual energy consumption of more than prescribed within the laws/regulation 2. Voluntary scheme for other companies, especially for SMEs to reduce 10% in 2030	Training of a certain number of energy managers/companies by DTEBP	USD 50 million	USD 60 million	Implementation of international standards such as 50001	30%	Conditional		Required corporation from private companies	5, 8, 9, 11, 12
3	**Efficiency energy and pollution management in latex and rubber wood processing**	Industry	Ministry of Agriculture, Forestry and Fisheries (MAFF)	CCPAP 2016-2020	NA	Piloting and establishment one completed demonstration local factory for latex and rubber timber processing (energy saving, pollution free, less chemical input, and improve quantity and quality of raw products)	Energy saving, reduce GHG and pollution from waste water, health and environment friendy, increased income and value added and employment, and safety working environment	USD 1,158,000	It is expected trained latex and wood processors will contribute to climate change impact through waste water treatment and biogas capture technology. Safety working environment and pollution free.	Waste water treatment plant and biogas capture technology, latex processing, wood processing, timber treatment,	Women participation in all production chain				5, 8, 9, 11, 12
5	**New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill** **Potential for private sector engagement in financing, constructing, and operating sanitary landfill and LFG systems**	Waste	Ministry of Environment (MOE)	1. PPCA conditional short-term and mid-to long term target (2035) 2. CSDG indicator 11.6 .1 3. National Waste Strategy Objective C 4. CCCSP strategy 1f and 4	GHG emission reductions due to avoidance of anaerobic decomposition of organic waste in landfills & dumpsites. - 1.12 $MtCO_2e$ or 1 $MtCO_2e$ in case action #2 composting is implemented in 2030 - Dangkor Landfill potential is around 0.14 to 0.16 $MtCO_2e$ /year in 2020	This action aims to increase the share of waste disposed at sanitary landfills with LFG extraction from 0% in 2020 to 50% by 2030 and extract LFG from the Dangkor Landfill	Reduced fire hazard 1. Decrease risk of collapse 2. Odour control 3. Reduced health hazard 4. Energy for leachate evaporation 5. Prevention of surface and groundwater contamination from toxic waste components 6. leachate capture and treatment 7. Employment creation	Conditional NDC action: Cumulative 2020-2030 investment in sanitary landfills: USD 664 million for flaring and USD 788 million including electricity generator (excluding land acquisition)	Estimated accrued income in the period of 2020-2030: 1. Electricity sales: USD 69.8 million 2. Carbon revenues: USD 25.97 million based on USD 5/carbon credit)	Available in the region, incl. Thailand	Gender diversity target: 40-60% of workforce are female at all levels (workers to middle and executive managers)	Conditional			5, 8, 9, 11
6	**Composting of biodegradable organic fraction of MSW supplemented with separation of organic waste (at source).** **Can be done at different stages in the waste management value chain, either at household, community level or at landfill site.** **Private sector can invest in and operate the composting facilities**	Waste	Ministry of Environment (MOE)	National Waste Strategy B (recycling + Strategy A (Separation) - PPCA Action Area 2-2 (Recycling Organic Waste)	GHG emission reductions due to avoidance of anaerobic decomposition of organic waste in landfills & dumpsites. -If 10% of all MSW generated is composted by 2030 then up to 0.5 $MtCO_2e$/year of GHG emissions can be avoided by 2030 (depending on BAU and operational practices during composting).	Increasing share of total MSW generated that is composted from 2% in 2016 to 10% by 2030.	Job creation 1. Reduced odour nuisance 2. Local organic fertilizer production 3. Less leachate leakage from landfill 4. Less landfill space required, so cost-savings (but space required for composting)	Conditional NDC action: 1. A one-time Investment cost (CAPEX): From USD 40-60 per annual tonne for windrow/static pile composting to USD 300-500 per annual tonne for in-vessel composting. 2. Operating costs: at least USD 32 per tonne for static pile composting.	Sale of local fertilizer (compost) 1. Implementation of quality standards required, so that produced compost has the right quality (no pollutants) and can be sold. 2. Basic quality of compost can be sold for USD 120 per tonne.	Available in Cambodia (e.g. COMPED and CSARO are operating a composting facilities)	Gender equality will be promoted by implementing good practices and involving women at all locations where the actions will be implemented. Women will play a crucial role in composting activities at household scale as traditionally women are more involved in cooking activities. Target:	Conditional			5, 8, 9, 11

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
											60% of ppl involved are women				
7	**Production of Refuse-Derived Fuel (RDF) from either a) fresh MSW or b) old MSW mined from the Dangkor landfill. The mechanical and biological separation and treatment of waste will be combined with an anaerobic digestion plant (generation of biogas from organic waste) to power facilities at the landfill.** **The produced RDF can be sold to e.g. cement industry as fuel.** **Private sector can invest in and manage the RDF and anaerobic digestion plant**	Waste	Ministry of Environment (MOE)	1. National Waste Strategy B (recycling + Strategy A (Separation) 2. PPCA Action Area 2-2 (Recycling Organic Waste)	1. GHG emission reductions due to avoidance of anaerobic decomposition of organic waste in landfills & dumpsites. 2. GHG ER for composting => see 5. 3. GHG ER from RDF + anaerobic digestion <0.2 $MtCO_2e$/year	1,100 ton/per day of MSW (fresh and landfill mining	1. Job creation 2. Reduced odour nuisance 3. local organic fertilizer production (bioslurry) 4. less leachate leakage from landfill 5. less landfill space required	Investment: USD 16,880,000 (excluding land)	Sale of surplus electricity to EdC - Sale of RDF: USD 25/ton - Sales of slurry/compost (quality standards required)	Available in regions, including Thailand and Vietnam	Promote gender equality and workers safety (health) situation by implementing good practices Target: 40 to 60% of ppl involved are women's	Conditional			5,8,9,11
8	**Implementation of National 3R strategy**	Waste	Ministry of Environment (MOE)	1. PPCA action area 2 SDG indicator 12.5 2. Sub-Decree on Solid Waste Management (SSWM) 3. The national strategy on 3R for waste management in Cambodia	1. GHG reduction due to reduced amount of plastic waste generated and burned. GHG reduction due to recycling of paper / wood 2. GHG emissions reduction 0.42 $MtCO_2e$/year	Cities and secondary towns	Achieving a recycle process with an environmental and economic purpose contributes to the goal of the environment and sustainability	1. Low cost for promoting awareness/campaign for public participation 2. High cost for recycling plastic (USD 4,000/ton)	1. In-country recycling will have significant economic benefits 2. Reduction of waste to be landfilled	Available in the region (Vietnam, Thailand, Malaysia)	Proportion of young women engages in waste management education. 50% of women will benefit from this action.				5, 8, 9, 11
9	**Bio-digesters construction (85% reduction compared to 2000)(Small size (2-3-4m3); Medium size(6-8-10m3), Large size(>10m3)**	Waste	Ministry of Agriculture, Forestry and Fisheries (MAFF)	NSDP 2019-2023; ASDP 2019-2023; Strategic Planning Framework for Livestock 2016 - 2025	Methane (CH_4) = sum ((n small scale*EFs) +(n mediunscale * EFm)+(n big scale * EFb)); the convert to C02 (using GWP); 4m3 = 4ton CO_2e	1,500 bio-digester plant per year (include: small=1450; medium= 45; large=5)	contributing people's livelihood as well as better economy	USD 12,750,000	Benefit in term of gas or fuel-wood reduction (250 USD/4m3plant /year/HH and get slurry (1,5-2,0t/4m3plant/HH)	Develop an acceptable and suitable biodigester for farmers and farms; Develop an effective bio-slurry for safe crop garden/farms to supply markets	Women participation were encouraged				5, 8, 9, 11
10	**Centralized recycling facility for industrial waste from the garment sector**	Waste	Ministry of Industry, Science, Technology and Innovation (MISTI)		- The GHG benefit targeted from the action is 0.12 $MtCO_2e$ from 2021-2030 at an average of 0.01 $MtCO_2e$/year	Accurate data generated on garment waste profile, quantity and management-50% of suitable garment waste captured for recycling	1. Provides job opportunities for landfill pickers in a safer environment2. Reduces energy costs and Provides a more comfortable environment for The occupiers of The buildings equipped with insulation3. Improves local air quality by reducing The open burning of garment waste, including at The landfills4. Reduces The need for landfill space5. Reduces The need of virgin materials for manufacturing building products	Indicative capital investment cost in the range of USD 2-3 million which includes collection trucks, warehouse, conveyor belts, shredder/grinder, compactors/moulders. This cost will vary depending on the final technologies selected.Operational costs will mostly consist of truck diesel (most garment companies are in the Phnom Penh area), labour and electricity.	Income derived from waste collection fees and selling the products, as well as seeking financial support from well-established international buyers.		Gender equality will be an important part of the project and strongly promoted. Many women work as waste pickers at the landfills and creating job opportunities in safer environments would be a central element of such project. Women represent 85% of garment manufacturing employees and their knowledge and technical know-how will be tapped in for assessing recycling options.			Special Economic Zone; GMAC; and Building Industry	5, 8, 9,11

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
11	**Better management of industrial wastewater in the food & beverage sector**	Waste	Ministry of Industry, Science, Technology and Innovation (MISTI)		1. GHG savings due to the anaerobic decomposition of carbon matter in the IWW and the inefficient running of treatment systems. 2. Water reuse will decrease the reliance on fresh water, which is sometimes extracted from depleting wells (e.g. in Bavet) 3. Less pollution of local waterways which may impact farmlands, especially in the dry season when the IWW is not diluted	Due to the lack of available data, it is difficult to estimate current GHG emissions and therefore derive emission saving targets (this should be built into the project). Assessment of methane production potential from IWW streams is depending on the concentration of degradable organic matter in the wastewater, the volume of wastewater, and the propensity of the industrial sector to treat their wastewater in anaerobic systems, or not treat it at all. One of the best ways to reduce GHG emission is to capture the methane generated by anaerobic IWW treatment processes. However, this can be only economically feasible for large scale operations. A study in China targeting IWW with a high concentration of organics treated with anaerobic systems indicated that the amount of gas recycled in 2010 was only 5.4% of total CH_4 emissions. Therefore, a target of 5-10% for Cambodia may be realistic as a starting point. Other targets may include: - 40% of required WWTPs are installed - 50% of identified improvement are implemented	1. Reduced energy and water costs at factories, by reduce water use and/or reuse treated wastewater 2. Improved air quality (odours) for workers and local populations 3. Improved water quality for local populations as direct discharge pollutes sources of water that may be used for cleaning, cooking and farming 4. Provides job opportunities for the installation of WWTPs 5. Opportunities to reuse the sludge, depending on the contamination profile	The total cost will depend on the number of factories targeted. Installing a new system is a net cost, but a basic system can be installed relatively cost effectively for SMEs. Improvements of existing systems will be done according to cost benefits analysis, aiming to work with factories that will save money. Overall, It could be aimed to set up a finance vehicle of USD 5-10 mn to support factories with co-financing.			Gender equality will be an important part of the project and strongly promoted. Many women work in factories. Furthermore, they are likely to be more exposed by the direct discharge of IWW in local waterways as they are primarily responsible for cooking and washing.				5, 8, 9, 11
12	**Application of electrical equipment labelling & MEPS (Lighting, Cooling & Equipment)**	Energy	Ministry of Mines and Energy (MME)	Increase market share of higher-class efficient appliances	1 Mt CO_2e/year	Reduce 1.2 TWh (29.7%) of electricity use in 2030	Labelling and standard product information of the consumption of energy	USD 250 million	USD 280 million	Labelling of electrical regulated appliances Comply with MEPS for electrical regulated appliances	30%	Conditional (With Support from Japan and Korea)		Require private sectors (Producer, Importer, Retailers) to be engaged and to comply with MEPS	5, 7, 8, 9, 11

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
13	**Public awareness campaigns**	Energy	Ministry of Mines and Energy (MME)	1. Investments in energy efficiency are seen more favourably to decrease energy consumption 2. Creation of both in relation to the use of energy efficient appliances, as well as concerning the features of the buildings	0.03 Mt CO_2e/year	Providing the necessary fundamentals to understand energy efficiency issues when in professional practice to reduce 2% in 2030. The approximate number of awareness programmes scheduled for a year? (25 programmes)	1. Reducing inefficient appliances/technologies uses 2. Informing the citizens of possibilities to improve EE and of related benefits	USD 20 million	USD 32 million	1. Develop curriculum for educational institutions 2. Social media to promote saving activities and preparation and broadcasting of a documentary film on Sustainable Energy	30%	Conditional		Public sector and Private sector	5, 7, 8, 9, 11
14	**Building codes and enforcement/certification for new buildings and those undergoing major renovation**	Energy	Ministry of Mines and Energy (MME)	Certification level new buildings built or undergoing major renovation		1. Reduce 10% of electricity consumption in 2030 2. kWh/m^2 reduction of energy demand in new buildings /buildings undergoing major renovation	Energy efficiency standards, laws and regulations concerning building energy codes are being elaborated and promulgated	USD 25 million	USD 40 million	Information needed to improve energy efficiency in building designs	30%	Conditional		Public sector and Private sector	5, 7, 8, 9, 11
15	**Introduction of efficient electrical industrial motors and transformer**	Energy	Ministry of Mines and Energy (MME)	Enforcement of efficient electrical transformers/motors in utilities /buildings/ industries which reduces electricity consumption	0.08 Mt CO_2e/year	Reduce 2.3% of current electricity consumption in 2030	Resolve of economic viability of investing in the improvement of energy efficiency of the equipment	USD 16 million	USD 21 million	Request to comply with new high-efficiency electric motors	30%	conditional		Public sector and Private sector	5, 7, 8, 9, 11
16	**Improve sustainability of charcoal production through enforcement of regulations**	Energy	Ministry of Mines and Energy (MME)	Draft Biomass Strategy Plan (MME)	Strengthen climate-resilient energy through increase clean charcoal production	100,000 ton/year by 2025 200,000 ton/year by 2030	Forest fire prevention and biodiversity protection	USD 10 million	USD 20 million	Mixing Rice husk, Coconut shield and cops	30%	Conditional		Incentives for green charcoal companies to be able to compete with traditional charcoal	5, 7, 8
17	**Increase energy access to rural area**	Energy	Ministry of Mines and Energy (MME)	At least 90% of household has access to electricity grid by 2030	Strengthen climate-resilient energy through electricity infrastructure improvement in order to respond to climate related disasters.	1. Increase energy access to 80% by 2020 2. Increase energy access to 85% by 2025 3. 90% by 2030	Local community has electricity 24 hours.	USD 40 million	USD 55 million	1. Solar Home System (SHS) 2. DC Micro grid 3. AC Micro grid Solar Battery Charging station	30%	Conditional		Public sector and Private sector	5, 7, 8
18	**Roadmap study on Integration of renewable energy resources (solar, wind, hydro, biomass) into energy mix**	Energy	Ministry of Mines and Energy (MME)	Target of generation power from various types renewable sources	Strengthen energy reliability	25 % of RE source into power mix (generation capacity) by 2030 (solar, wind, hydro and biomass)	Reduce imports energy sources and increase clean energy	USD 300,000	USD 600,000	1. Solar PV 2. Onshore wind 3. Dam reservoir / run river 4. Waste to Energy	30%	Conditional +Unconditional		Public sector and Private sector	5, 7, 8, 9, 11
19	**Diversification of household and community energy generation sources to reduce reliance on biomass as an energy sources**	Energy	Ministry of Mines and Energy (MME)	Draft Biomass Strategy Plan (MME)	Strengthen climate-resilient energy through increase clean charcoal production						30%	Conditional			5, 7
20	**Reducing GHG emission though off grid street lightening of rural municipality**	Energy	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: 1. Leverage the decentralization process to strengthen financial and institutional processes for local adaptation 2. Mainstream climate change into national and sub-national development plans and the NSPS	Reducing GHG emission though energy consumption of street lightening of the rural municipality	10 Sangkat of Senmonorom Municipality, Kep Municipality, and Preah Sihanuk Municipality integration of climate change into financial management, institutional arrangement and policy reform by 2028	1. Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission 2. NCDD will also implement ESS, Gender, M&E along with climate action	USD 10 million	USD 15 million	1. Climate change governance 2. Climate vulnerability and impact assessment for 5 target Sangkat 3. National Green Growth Policy	30%			Private sector engagement through technical support	5, 7, 8, 9, 11

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
21	**Toward Battambang city to green city**	Energy	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: 1. Leverage the decentralization process to strengthen financial and institutional processes for local adaptation 2. Mainstream climate change into national and sub-national development plans and the NSPS	Reducing GHG emission though green city planning and ecofriendly habitant.	5 Sangkat of Battambang municipality integration of green city, and ecofriendly into financial management, institutional arrangement and policy reform by 2025	1. Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission 2. NCDD will also implement ESS, Gender, M&E along with climate action) Paradam shif	USD 8 million	USD 15 million	1. Climate change governance 2. Climate vulnerability and impact assessment for 5 target Sangkat 3. National Green Growth Policy	30%		Youth volunteers in green space arrangement	Private sector engagement through technical support	5, 7, 8, 9, 11
22	**Eco-payment based on changing behavior on fire wood use of community in Angkor and Kulen Conservation Park**	Energy	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023:a) Leverage the decentralization process to strengthen financial and institutional processes for local adaptation) Mainstream climate change into national and sub-national development plans and the NSPS	Reducing GHG emission though avoiding the extraction of the forest from Angkor conservation park and Kulen conservation park for housing, fire wood consumption, and agriculture land.	20 communes of Prasat Bakong district, Kulen District, Norkor Krav District, and Banteay Srey District, of Siem Reap Province integration of climate change into financial management, institutional arrangement and policy reform by 2030	1. Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission 2. NCDD will also implement ESS, Gender, M&E along with climate action	USD 7 million	USD 15 million	1. Climate change governance 2. Climate vulnerability and impact assessment for 5 target Sangkat 3. National Green Growth Policy 4. Performance based climate resilient grant	30%		Youth volunteers in green space arrangement	Private sector investment through eco-tourism or PPP	5, 7, 8, 9, 11
23	**Cooling of public sector buildings**	Energy	Ministry of Industry, Science, Technology and Innovation (MISTI)	1. MME Standards & Labelling for cooling appliances (DRAFT) 2. MOE Guidelines for Green Building (DEVELOPING) 3. MME (with EU and ADB) Energy Efficiency Policy (DRAFT)	1. GHG emissions are reduced by a decreased reliance and use of mechanical ACs 2. GHG emissions are reduced by through energy efficient retrofits in public buildings 3. The adoption of climate-friendly cooling across all Cambodian public sector buildings would results in 0.04 $MtCO_2e$ reductions against BAU per year	Without stronger measures to encourage the uptake of more efficient units, IEA estimates that rising electricity demand from cooling alone is projected to require around 200 GW of additional generation capacity in 2040 and cooling could be responsible for as much as 30% share in the ASEAN region's peak electricity demand. Deploying more efficient ACs, along with other efficient equipment and building efficiency improvements, would permit ASEAN countries to save 110 TWh of electricity by 2040. This NDC action aims to implement climate-friendly cooling in public buildings to reduce GHG emissions: The adoption of climate-friendly cooling across all Cambodian public sector buildings would result in 0.04 $MtCO_2e$ reductions against BAU per year.	Cooling of public buildings has many benefits, including: 1. Reduced GHG emissions – climate-friendly solutions to cooling buildings reduces the reliance on ACs which are a source of GHGs 2. Improved living conditions – as temperatures rise, cooling of buildings in a necessity to avoid heat stress and the subsequent health risks	USD 67 million							5, 7, 8, 9, 11

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
24	**Promote sustainable energy practices in manufacturing**	Energy	Ministry of Industry, Science, Technology and Innovation (MISTI)	The National Policy, Strategy and Action Plan on Energy Efficiency in Cambodia (MIME 2013), Basic Energy Plan (2019), The National Policy on Green Growth and the National Strategic Plan on Green Growth 2013-2030 and Industrial Development Policy 2015-2025.						Technology transfer in key industrial sub-sectors which are process heat intensive: bricks, food and beverage	Energy efficiency measures cut the production cost and significantly boost competitiveness and productivity of manufacturing, enabling job creation. Women account for 25% of the industry workforce and around 85% of garment workers, Cambodia's largest industrial sector	Conditional	Possibility for youth engagement related to factories, retailers, technology vendors etc.	Private sector involvement through factories, GMAC, retailers, ESCOs and technology vendors	5, 7, 8, 9, 11
	1: Sustainable energy practices in garment Industry				Garments 2.3MtCO_2e, 55% vs BAU by 2030		Improving energy productivity, reducing ambient temperatures through ventilation and cooling optimization and decreasing fugitive heat losses from steam and compressed air delivery systems								
	1.1: Upgrade to efficient boiler				- GHG emission reductions: 0.03 MtCO_2e/year for 26 boilers, approximately			Each efficient boiler is estimated at USD 60,000 cost.	In monetary terms, savings represent USD 13.2 million in avoid wood biomass cost at an average value of USD 40.61/ton.						
	1.2: Sewing machine				GHG emission reduction is estimated at 0.002 MtCO_2e/year for 3,500 new electric machines.			Each efficient sewing machine is estimated at USD 200.	In monetary terms, electricity savings represent USDk 468 in a year, at an average electricity cost USD 0.1475/kWh.						
	1.3: Washing machine				GHG emission reduction is estimated at 0.0002 MtCO_2e/year for 130 new washing machines			Each efficient washing machine is estimated at USD 3,500.	In monetary terms, electricity savings represent USDk 34.8 in a year, at an average electricity cost USD 0.1475/kWh.						
	1.4: Drying machine				GHG emission reduction is estimated at 0.0001 MtCO_2e/year for 65 new drying machines.			Each efficient drying machine is estimated at USD 3,500.	In monetary terms, electricity savings represent USDk 17.4 in a year, at an average electricity cost USD 0.1475/kWh.						
	1.5: Compressors				GHG emission reduction is estimated at 0.0007 MtCO_2e/year for 40 new compressors.			Each compressor is estimated at USD 20,000.	Introducing 40 compressors will save 693 MWh/year electricity, totaling 6,930 MWh by 2030. (40 compressors x 17.3 MWh x 10 years)						
	1.6: Efficient lightning appliance				- GHG emission reduction is estimated at 0.005 MtCO_2e/year for 150,000 new efficient lightning appliances.			Each lightbulb is estimated at USD16.	In monetary terms, electricity savings represent USDk 730 in a year, at an average electricity cost USD 0.1475/kWh						

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
	2: Sustainable energy practices in brick industry				Bricks 1.8 $MtCO_2e$, 44% vs BAU by 2030		Improving brick kiln efficiency can improve the safety of brick kiln operation through implementation of better safety features that reduce risk of injury during loading of fuel and handling of bricks. Reducing the toxicity and amount of emission pollutants coming from brick kilns is also an expected benefit to implementing energy efficient technology.								
	2.1: Boat-to-rotary kiln upgrade				Roughly estimated GHG emission reductions: 0.03 $MtCO_2eq$/year for 8 rotary kiln replacing same amount of boat kilns.			Each rotary efficient kiln is estimated at USD 200,000 cost.	In monetary terms, savings represent USD 1.57 million in avoid wood biomass cost each year, at an average value of USD 40.61/ton.						
	2.2: Modified boat-to-rotary kiln upgrade				Roughly estimated GHG emission reductions: 0.01 $MtCO_2e$/year for 6 rotary kiln replacing same amount of modified boat kilns.			Each rotary efficient kiln is estimated at USD 200,000 cost.	In monetary terms, savings represent USDk 700 in avoided wood biomass cost each year, at an average value of USD 40.61/ton.						
	3: Sustainable energy practices in food & beverage Industry				Food and Beverage 1.04 $MtCO_2e$, 25% vs BAU by 2030		Improving energy productivity, reducing ambient temperatures through ventilation and cooling optimization and decreasing fugitive heat losses from steam and compressed air delivery systems								
	3.1: Replacing inefficient boilers in the F&B industry				Roughly estimated GHG emission reductions: 0.02 $MtCO_2e$/year for 17 highly efficient boiler replacing same amount of low efficient units.			One efficient boiler is estimated at USD 37,000 cost.	In monetary terms, savings represent USDk 830 in avoid wood biomass cost each year, at an average value of USD 40.61/ton.						
	4: RECP practices in the manufacturing industries														
	4.1: Replace an LPG fired boiler consuming about 704,428 L/year with a biomass-residues fired boiler in a Food Import and Export company				Reduction of firewood by 20%, it represents 0.00001 $MtCO_2e$/year			Savings in monetary value USD 263/year							
	4.2: Replace a diesel-fired dynamo with grid electricity at a milling factory; the diesel dynamo is consuming 12 liters/hour operating for 8 hours/day, 20 days/month							Installation of new additional biomass residue briquette-based boiler equipped with gas treatment system, USD 33,850	Savings in monetary value USD 263/year						
	4.3: Improve operations at a noodles manufacturing unit to reduce the usage of one boiler from existing four-boiler system							Switch to new system for collective distribution using 3 boilers instead of 4 independent boilers.	Savings in monetary value US 5,301						
	4.4: Install a system to collect and re-use waste steam and hot water from meat steamer, resulting in about 524 m3/year of fuelwood saving							Install a system to reuse the deposits of steam USD 6,495							

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
25	**Actions to promote sustainable sourcing of fuel wood in the garment industry**	Energy	Ministry of Industry, Science, Technology and Innovation (MISTI)	1. The Forest Law of 2002 2. National REDD+ Strategy (NRS) 2017-2021 3. National Forest Program 2010-2029 4. Industrial Development Policy 2015-2025	Year - Annual climate impact - Total climate impact 2019 40,360 40,360 2020 51,052 91,412 2021 72,895 164,307 2022 118,702 283,009 2023 115,426 398,435 2024 137,269 535,704 2025 184,169 719,873 2026 179,965 899,838 2027 213,899 1,113,737 2028 135,403 1,249,140 2029 135,487 1,384,627 2030 135,487 1,520,114	1. 6000 ha of timber plantations established between 2021-2030 2. 1800 ha of firewood plantations established between 2021-2030 Further evaluations have to be carried out to set a quantified target for this action. Achieving the defined target will be highly dependent on availability of climate finance, including both public and private sources, to conduct and scale up the defined activities. Linked government actions in the forestry value chain that incentivize demand side investment, such as reducing the availability and hence pushing up the cost of unsustainable fuel wood, is key to achieving the defined targets. Accessing climate finance associated with forest preservation to fund demand side interventions is a necessary barrier to overcome to scale factory investment that affect unsustainable wood fuel production.	Co-benefits to this action include the following: 1. Improved air quality due to reduced wood fuel combustion and improvement in combustion efficiency 2. Reduction of soil erosion and silting of lakes and rivers 3. Increased productivity of agricultural land affected by deforestation 4. Job creation from implementing demand side energy efficiency measures 5. Increased export industry competitiveness	Total investment costs: Approximately USD 19,590,250		Challenges with selection of appropriate variety of fuelwood and lands for sustainable fuelwood production	Children, especially girls, and women will benefit from this action by reducing the amount of distance they have to extract fuelwood.	Conditional		Private sector engagement through factories and plantations	5, 7, 8, 9, 11
26	**Implementation of National Cooling Action Plan** **- Direct emission reduction due F-gas transition in air-conditioning and refrigeration** **- Indirect emission reduction due to improved cooling efficiency** **- Additionally, Inclusion of performance requirements of Passive Cooling Systems in Building Energy Code and implementation of "passive cooling" measures in the cities can be carried out as part of the implementation of the NCAP – see below**	Energy	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	Integration of the Kigali Amendment to Montreal Protocol mandated F-gas transition plans with plans to improve cooling efficiency and access to cooling. NCAP and its roadmap to support the adoption of Enhanced MEPS for cooling appliances and improve existing energy policies.	Emissions – 1.09 $MtCO_2e$ emissions by 2030 Direct GHG Emissions reduction – 0.17 $MtCO_2e$ emissions Indirect GHG emissions reduction – 0.92$MtCO_2e$	Enhanced MEPS and F-gas transition for room air conditioners and residential refrigerators targeting the new & existing equipment stock in the country.	Improvement in affordability and access to cooling for the population Improvement in local R&D and manufacturing Enhancement of customer trust and promotion of new & local market players Generation of jobs and boost in economy	Costs: USD 50 million Benefits: Total cumulative savings after 10 years of implementation USD 1,320 Million through energy savings by 2030 (Considering USD 50 million investment and 10 years cumulative electricity savings of 6.1 TWh through NCAP)		Low GWP refrigerants like R1234yf, R32, CO2, Hydrocarbons, etc., High Seasonal Energy Efficiency Room Air conditioners Climate adaptive and energy efficient refrigerators		Conditional			5, 7, 8, 9, 11

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
27	**Inclusion of performance requirements of passive cooling systems in building energy code of Cambodia**	Energy	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	Environment and Natural Resources Code, which has a chapter on Sustainable Cities, making it a requirement for the capital city and cities over 200,000 people to develop a Green City Strategic Plan and identify green city development projects.	0.14 $MtCO_2e$ emissions until 2030	20% of the newly constructed buildings will comply with Building Energy Code	Improved air quality, more jobs and better economy, better energy security and grid reliability	Costs: USD 750,000 ROI: 44% Payback period: 2.25 years		Envelope insulation, high performance glazing, Insulated door/window frames, air-tightness, shading, ventilation, cool roofs		Conditional			5, 7, 8, 9, 11,
28	**Implementation of "passive cooling" measures in the cities (addressing urban heat island effect [UHIE]), public buildings and commercial buildings.**	Energy	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	Environment and Natural Resources Code, which has a chapter on Sustainable Cities, making it a requirement for the capital city and cities over 200,000 people to develop a Green City Strategic Plan and identify green city development projects.	0.07 Mt CO_2e emissions until 2030	2 cities (Phnom Penh and Siem Reap) analysed for mitigating UHIE and projects are implemented - 2% of the existing public and commercial buildings are retrofitted with passive cooling measures	Health and well-being of the citizens, energy cost savings to the consumers, improved aesthetics, increased productivity of the population, vegetation acting as carbon sinks	Costs: USD 49 million ROI: 22% Payback period: 4.5 years		Urban planning, cool/green roof and greening of city		Conditional			5, 7, 8, 9, 11,
29	**Promote integrated public transport systems in main cities**	Transport	Ministry of Public Works and Transport(MPWT)	1. Cambodia Climate Change Strategic Plan 2014-2023, 2. NSDP 2019-2023, 3. Rectangular Strategy, 4. National Policy on Green Growth, 5. Sectoral development plans.								Conditional			3, 5, 8, 9
30	**Enhance maintenance and inspection of vehicle (Piloting maintenance and emission inspections of vehicles)**	Transport	Ministry of Public Works and Transport (MPWT)	1. Cambodia Climate Change Strategic Plan 2014-2023, 2. NSDP 2019-2023, 3. Rectangular Strategy, 4. National Policy on Green Growth and sectoral development plans.		20 or 30 vehicle inspection centers will be in operation by 2030. 1 million vehicles are expected to be inspected by 2030	1. Reduce maintenance cost/saving cost 2. Reduce traffic accident, injury and fatality 3. Reduce air pollution 4. Reduce GHG emission 5. Innovate technology	USD 600.00 1. Public and public 2. Private partnership investment opportunity 3. Purchasing/ upgrading the current system 4. Demonstrate the system	Benefit 1. Time saving 2. Reduce maintenance cost/saving cost 3. Reduce traffic accident, injury and fatality 4. Reduce air pollution and GHG	Technology is unavailable and costly; however, the originated country is seeking for/requiring assistant from foreign country. Lack of experts and staffs need to be trained.		Conditional			3, 5, 8, 9
31	**E-mobility**	Transport	Ministry of Public Works and Transport (MPWT)	Baseline: 09 vehicles(battery vehicle) are registered by 2020;								Conditional			3, 5, 8, 9
32	**Establish green belts along major roads for climate change mitigation**	Transport	Ministry of Public Works and Transport (MPWT)												3, 5, 8, 9
33	**Shift long distance freight movement from trucks to train**	Transport	Ministry of Public Works and Transport (MPWT)	By 2030: No available											3, 5, 8, 9
34	**Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	National Action Program to combat land degradation 2018-2027	NA	Battambang ; Preah Vihea and Kampong Cham Provinces	Sustainable land management, reduce emission from burned agriculture residue, protect soil from erosion	USD 24,963,000	Reduce emission and soil erosion, increase soil organic carbon andvicrop yield	Conservation agriculture; Minimum tillage, mulching with crop residue, and crop rotation; legum growing;	Encourage the participation of women				2, 6, 15

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
35	**Organic input agriculture and bio-slurry; and deep placement fertilizer technology**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	National Action Program to combat land degradation 2018-2027	NA	10 provinces	Reduce of chemical fertilizer utilization, contribution to mitigate the greenhouse gases, reduce production cost and pollution, and soil improvement	USD 2.6 million	Reduce production cost and pollution from chemical fertilizer, sustainable land management	Composting, bio-digester, manure management	Encourage the participation of women				2, 6, 15
36	**Promote fodder production to improve high nutrient rich and high-quality forage feed value agriculture by-products technology to support cattle production**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	NSDP 2019-2023; ASDP 2019-2023; Strategic Planning Framework for Livestock 2016 - 2025	NA	1year/1ha/province	Increase soil organic carbon, Enhanced adoption by farmers of improved fodder technology has significantly increased animals' production and household income;	USD 625,000	Reduce cost of feed and medicine input	fodder manual is available	Women participation were encouraged to take care it				2, 6, 15
37	**Promote manure Management through compost making process to reduce carbon emission**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	NSDP 2019-2023; ASDP 2019-2023; Strategic Planning Framework for Livestock 2016 - 2025	NA	25 provinces and cities	Increase GAHP "Good Animals Health Practice" enhanced adoption by improving animal farms and slaughterhouses; household	USD 21.25 million	reduce environment pollution from Farms and slaughterhouses and household	Compost technology is available	Women participation were encouraged				2, 6, 15
38	**Seedlings distribute to public and local community**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	NFPs_(F.3)strategic indicators, JMI (2020), National arbor day	NA	100,000,000 seedling	Contributing forest cover, promote CF livelihoods, and cultural	Long term USD 1 /seedling; medium plan USD 0.5/seedling ; Fast growing USD 0,3/ per seedling	Revenue is referred to social, environmental and promoted people livelihood	Simple guide for tree plantation, Nursery management	Women participation were encouraged				2, 6, 15
39	**REDD+** **1. Strengthen management of forest conservation areas, such as protected areas and flooded and mangrove conservation areas - Promote forest land tenure security through forest land classification, zoning, demarcation, and registration** **2. Strengthen law enforcement activities to address unauthorized logging, and encroachment** **3. Monitor the status of ELCs and SLCs for compliance with regulations and strengthen capacity for effective monitoring** **4. Support harmonization of legal frameworks for effective management of forest resources** **5. Strengthen regulatory framework and capacity for social and environmental impact assessment and compliance** **6. Strengthen capacity for data management and establish decision support systems for forest and land use sector**	Forestry	REDD+ Secretariat	Key Indicator of Rectangular Strategy phase - 4	Reducing of CO_2e emission	21.54 Mt CO_2. e/year									2, 15

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
	7. Strengthen and scale up community-based forest management 8. Engage and encourage the private sector to implement alternative and sustainable supply chains from agro industrial plantations, and to reduce emissions 9. Expand afforestation, reforestation and restoration activities 10. Enhance timber supply and wood-based energy sourced from community-based forest management areas and private plantations to reduce pressure on forest areas 11. Promote effective, equitable, sustainable management and use of forests, forest lands and non-timber forest products 12. Identify and implement alternative and sustainable livelihood development programmes for local communities most dependent on forest resources														
	13. Support mechanisms to mainstream policies and measures that reduce deforestation in relevant government ministries and agencies14. Strengthen national and subnational capacity for improved coordination mechanisms for national land use policy and planning 15. Strengthen capacity, knowledge and awareness of stakeholders to enhance their contribution to reducing deforestation and forest degradation 16. Encourage public engagement, participation and consultations in forestry and land use planning, and promote the involvement of multiple stakeholders 17. Strengthen capacity of academic and research institutions in training, research and technology development associated with forestry and land use 18. Establish partnerships with development partners in building knowledge and human resources related to forestry, land use and climate change														

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
40	**1. Promoting one tourist, one tree campaign**	Tourism	Ministry of Tourism (MOT)	Royal Government of Cambodia labels tourism sector as "Green Gold". Tourism is a non-smoke industry which import in places.		Baseline: 5 locations Kompong Speu 20,000 tree Kratie (Kosh Trong) 5,000 trees Kompot (Kompong Samaki) 500,000 and other locations approximately is 500,00 Target: 25 locations covering all provinces/city	Reducing natural disaster, job creation for local people, poverty alleviation, social welfare improvement, cultural and environmental conservation, protecting biodiversity.	USD 2 million	USD 2.5 million	Public toilet, education signboard, billboard, rubbish bin etc. The M&E system will be aligned with National Monitoring and Evaluation Framework for Climate Change.	Encouraging women, elderly, children, poorest to involve, they might understand and support new mindset that would provide (for adaptation projects).	Small unconditional for planting tree, state-public land Conditional to support community for developing and maintain/care tree	1. Youth could join by in-kind and cash to support the activity	1. Private sector could join by in-kind and cash to support the activity. 2. Private sector and community could take benefits	
41	**2. Practicing responsible travel manner in order to protect and conserve environment, biodiversity, culture and local livelihood improvement**	Tourism	Ministry of Tourism (MOT)			Baseline: 58 Hotel (3 start) Target: 150 Hotels						Conditional		MoT will closely work with travel agencies and private sector to promote those relevant guidelines.	
42	**3. Always remind and practice 3R in all tourists´acivities**	Tourism	Ministry of Tourism (MOT)			Target: all tourist activities would be targeted						Conditional		Private would provide bags, re-fill bottle water, support recycle shops or association. Provide big bottle water for refilling.	
43	**4. Reducing energy use, improving energy efficiency, increasing the use of renewable energy, carbon offsetting, waste management and recycling, and water conservation**	Tourism	Ministry of Tourism (MOT)		Emission reduction: 1- Be more activities from tourists including; adventure, cycling, walking, hiking, Stop using car, bus, van and other vehicle by using gas/energy into tourist sites by replace of cow cart, ride bicycle, or walking.							Conditional		Private sector/agencies are key	
44	**5. Operating sustainable destination management**	Tourism	Ministry of Tourism (MOT)		Emission reduction: 1- Be more activities from tourists including; adventure, cycling, walking, hiking, Stop using car, bus, van and other vehicle by using gas/energy into tourist sites by replace of cow cart, ride bicycle, or walking.							Conditional		Private sector/agencies are key	
45	**6. Promoting adventure and green tourism activities**	Tourism	Ministry of Tourism (MOT)		Emission reduction: 1- Be more activities from tourists including; adventure, cycling, walking, hiking, Stop using car, bus, van and other vehicle by using gas/energy into tourist sites by replace of cow cart, ride bicycle, or walking.							Conditional		Private sector/agencies are key	
46	**Installing air quality monitoring equipment in all provinces across the countries and establishing air quality data monitoring center with mobile application for public information and access**	Other industry	Ministry of Environment (MOE)									Conditional		Private sector engagement through technical support	

No.	Mitigation action	Sector	Ministry	Government priority	GHG mitigation potential	Baseline and targets	Co-benefits(adaptation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
47	**Establishing air quality monitoring and broadcasting center**	Other industry	Ministry of Environment (MOE)					Cost (Installing air quality monitoring equipment and establishing data center and mobile application). Cost of air quality monitoring equipment is around USD 5,000/unit (215 X 5,000 = USD 1,075,000) - Benefit (air quality data, public health early warning system)				Conditional		Private sector engagement through technical support	
48	**Improving urban environmental management through increasing green spaces in the city**	Policy and planning	Ministry of Environment (MOE)									Conditional		Private sector engagement through technical support	
49	**Emission management from factories**	Other industry	Ministry of Environment (MOE)									Unconditional		Require full private sector engagement	
50	**Air quality management from construction sites**	Other industry	Ministry of Environment (MOE)					USD 500,000				Unconditional		Require full private sector engagement	
51	**Development of a long-term low emission strategy**	Policy and planning	National Council for Sustainable Development (NCSD)									Conditional		Require full private sector engagement	

Appendix 2: Detailed Adaptation Actions

No.	Adaptation action	Sector	Ministry	Government priority	Resilience building potential	Baseline and targets	Co-benefits (mitigation, environmental, social)	Finance costs (USD)	Finance benefits	Technology availability	Gender	Conditional/ Unconditional	Youth	Private sector	SDGs
1	**Towards an agroecological transition in the uplands of Battambang**	Agriculture	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: 1. Leverage the decentralization process to strengthen financial and institutional processes for local adaptation 2. Mainstream climate change into national and sub-national development plans and the NSPS	Strengthen local agricultural practice to respond to climate hazards through innovation of agroecological technology	Baseline is 0. Target: 100,000 by 2026 (with policy intervention the project has the potential to scale-up to 5 million people accounting for 30% of total population)	1. Climate Change mitigation as the project considering of low-carbon agricultural technology 2. Improved new management approach in agroecosystem 3. NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	10,000,000	11,000,000	1. 10 elements of agroecology by FAO 2. GCF funding modalities and investment criteria standards 3. NCDD accreditation standards	Target 30% women beneficiaries 50% participation of women in stakeholder consultations and 50% women representation on project decision making boards The component of project output to be aligned with Policy on Promotion of Gender Equality for Sub-national Democratic Development of NCDD			Private sector from the agriculture supply chain	2, 5, 12, 13
2	**(Program 1: Improvement of Agricultural Productivity and Diversification and Agri-Business) Development of rice crops for increase production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	ASDP (2019-2023)	Increase rice productivity, reduce loss during and post harvesting and improve rice quality, safety.	Baseline: 11.51 million tonne in 2020 Target: 3% increased production/year	Promote climate-friendly Agri-business rice value chain and profit in rice production value chains. Mitigating impact of rice farming on environment	37,122,000	25 provinces; 2,439,000,000 (master plan of MAFF 2019-2030)	Stress tolerant varieties, Agriculture(CSA), Sustainable Rice Platform (SRP),Good Agricultural Practices (GAP), Organic Agriculture, ISNM, Integrated Pest management (IPM), water saving techniques, System of Rice Intensification (SRI), Complex Rice System (for example duck-rice farming), Agroforestry, on-farm seed conservation and selection technics and post-harvests technologies, Sustainable landscape management (land levelling, integrated micro-watershed management).	Enhance women's economic empowerment and promote the participation of women in decision-process within the value chain, with emphasize on post-harvesting opportunities and agro-business (incl. women in Rice ACs, capacity development for leadership roles within ACs etc.). Ensure women's meaningful and active participation in capacity development and opportunities. This requires gender related targets such as, (1) equal representation of women and men (50% women) participate in stakeholder consultations; (2) 35% (suggest this could be 50% to be equal with men) of the total project beneficiaries of extension services, training and inputs are female farmers, and (3) 50% of women beneficiaries self-report a reduction in their work burden as a result of project activities At least 35% of female-farmers (including female-headed households) will benefit from relevant trainings, access to resources, extension services taking into account their work burdens.		Youth represents 47.1% in agriculture sectors. They will be engaged in capacity development, technology transfer in relation to sustainable agriculture including Climate Smart Agriculture (CSA), Good Agriculture Practice (GAP), and pre and post-harvest techniques. Youth will be strongly involved in Sustainable Rice Platform (SRP), and Agriculture Cooperative (ACs), enterprise development and agro-business activities to ensure food security and income generation among the youth groups.	Various private sector players i.e. rice miller, processing, exporter, producers; inputs suppliers; buyers will be promoted in rice crop production. The private sectors will be strongly engaged/involved in working with small scale farmers such as providing technical assistance, support to provide credit so that farmers can access to inputs and contracting to buy the product	2, 5, 12, 13

3	**Development of horticulture and other food crops for increase production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	ASDP (2019-2023)	Increase horticulture production and productivity and profit in horticulture production value chains through using tress tolerant varieties and CSA practices and increasing resilience to climate change. Fostering local chemical free produced vegetable value chains by improving sustainable water management practices, promoting diversification to increase food security, access to healthy food and diversified income opportunities resilient to climate change.	Baseline: 70% in 2020 Target: Increased supply of vegetable 2% /year to local market	47.1% of youth who involved in agriculture sectors, will be provided capacity development, technology transfer in various form of sustainable agriculture including Climate Smart Agriculture (CSA), Sustainable Rice Platform (SRP) and Good Agriculture Practice (GAP). Youth will be strongly involved in pre and post-harvest technology, and Agriculture Cooperative (ACs), Enterprise development and other agro-business enhancement to ensure food security and income generation among the youth groups.	15,238,000	25 provinces; Investment return not estimated	Stress tolerant varieties, Climate Smart Agriculture (CSA), Conservation Agriculture (CA),Good Agricultural Practices (GAP), ISNM, Integrated Pest Management (IPM), Participatory Guarantee Systems (PGS), Organic Agriculture, water saving techniques post-harvests technologies and stress tolerant species and varieties, intercropping, agroforestry, crop rotation, mixed cropping /companion planting, integrated farming system approach	At least 35% of women are involved in agriculture sector. Empowering women through strengthening their roles and capacities in the horticultural value chains, increasing income generation and food security at the same time through for example surplus selling of home garden systems. Decrease work burden for women through improved practices and technologies (for example drip irrigation) empower women through improved nutrition to their household. Target: 1. 40% of total beneficiaries receiving training on horticulture are women; 2. 50% of all women project beneficiaries avail childcare services to enable their full participation in horticulture training programs; 3. 50% of all gender awareness training participants are men; 4. 50% of all women project beneficiaries report an increase income as a result of project activities; and 5. 50% of women project beneficiaries report a reduce in hours spent on horticulture activities as a result of access to improved practices and technologies (Ref:FAO and MAFF, 2017: Gender Assessment in Agriculture sector. MAFF, 2015: Gender mainstreaming policy and strategic framework in Agriculture 2016-2020. MoP, 2017: Cambodia Socio-Economic Survey 2017)		Youth represents 47.1% in agriculture sectors. They will be engaged in capacity development, technology transfer in relation to sustainable agriculture including Climate Smart Agriculture (CSA), Good Agriculture Practice (GAP), and pre and post-harvest techniques. Youth will be strongly involved in Sustainable Rice Platform (SRP), and Agriculture Cooperative (ACs), enterprise development and agro-business activities to ensure food security and income generation among the youth groups.	Promote and engagement of private sector including investors/input suppliers, exporters, and SME/ entrepreneurs to be involved in the horticulture value chains that can boost multiple and double cropping to adapt with climate variability; particularly in dry season for smallholders and medium farmers aiming to improve food security and income generation.	2, 5, 12, 13

4	**Development of Industry crops for increase in production, improved quality-safety; harvesting and post harvesting technique and agro-business enhancement**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	ASDP (2019-2023)	Increase industry crop productivity and profit in the production value chains through stress-tolerant varieties and CSA practices and increasing resilience to climate change. Diversification will also contribute to increase in income (Land equivalent ratio) and diversification of economic opportunities of farmers to adapt to climate change. Increase in income through improvement in processing technologies.	Baseline: 19.166 million tons in 2020 Target: 10% increased production per year	Promote climate-friendly Agri-business value chain and profit generation boosting local food security through diversification, reduction in soil degradation and greenhouse gas emissions through fostering eco-system services through CSA practices.	12,506,000	25 provinces; Investment return not estimated	Climate Smart Agriculture (CSA), Agroforestry, Integrated Soil and Nutrient Management (ISNM), Integrated Pest Management (IPM), Botanical pesticide production, organic fertilizer, Conservation Agriculture (CA), water saving techniques and post-harvests and processing technologies and improving stress tolerant species and variety selection.	Promote women in collective business and provide relevant technical trainings and capacity building on quality, safety, harvest, post-harvest, financial literacy, enterprise development and processing/packaging skills. At least 50% women are engaged in consultation, planning and decision making process for sustainable landscape management through the application/replicate of the CSA practices, agroforestry, conservation agriculture, etc. Strengthen women's leadership roles and knowledge sharing on women-led success stories women's good practices to improve women's opportunities within the Value Chains and/or sustainable market accessibility which ultimately contribute their increase in income generation and food security. 50% of women beneficiaries report an increase in income generation as a result of improved market accessibility 50% of women beneficiary's report food security through a 12-month period as a result of the project activities.		Youth represents 47.1% in agriculture sectors. They will be engaged in capacity development, technology transfer in relation to sustainable agriculture including Climate Smart Agriculture (CSA), Good Agriculture Practice (GAP), and pre and post-harvest techniques. Youth will be strongly involved in Sustainable Rice Platform (SRP), and Agriculture Cooperative (ACs), enterprise development and agro-business activities to ensure food security and income generation among the youth groups.	Promote private sector players in various phases of industrial crop value chain. They will be involved in support to provide sustainable agriculture practices, techniques and technology transfer, improving water management practices, pre and post-harvest technology, processing (i.e. cashew nut/cassava processing) and certification for market expansion.	2, 5, 12, 13, 15
5	**Improvement of support services and capacity building to crop production resilient to climate change by promoting research, trials and up-scaling climate-smart farming systems that increase resilience to CC and extreme weather events**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	ASDP (2019-2023)	Boosting climate-resilient agriculture adoption by Institutional capacity building and extension services to transfer CSA technology to farmers. This will enable farmers to respond to climate hazards, improve food security and productivity, and increase ecological and economic resilience while	Baseline: Departments of GDA and 12 Seed farms, research stations and development and training centers, selected Agricultural Cooperatives.Targets: Increasing resilience to climate change and natural disasters, and improving resilience facilities, tools and technologies.	Increasing resilience to climate change and natural disasters, and improving resilience facilities, tools and technologies.	69,562,000	10 Departments of GDA, 12 Seed farms research stations and development and training centers, and selected Agricultural Cooperatives.	Crop production manuals (e.g. SRP, GAP, Post-harvest technologies/tools, Agricultural Organic Standards, irrigation facilities, saving water technologies/tools, green houses) and Irrigation facilities and agricultural machinery tools/ equipment), Climate Smart Agriculture (CSA), Agroforestry, Integrated Soil and Nutrient management (ISNM), Integrated Pest Management (IPM), Botanical pesticide production, organic fertilizer, Conservation Agriculture (CA), water saving techniques (rainwater harvesting, drip irrigation etc.) and post-harvests and processing	35% of female farmers participate in capacity development35% of female farmers receive extension services35% of female farmers report a reduction in hours spent on their agricultural activities as a result of project activities Strengthen women's leadership roles and knowledge sharing on women-led success stories women's good practices to improve women's opportunities within the Value Chains and/or sustainable market		Youth represent 47.1% in agriculture sectors. They will be engaged in capacity development, technology transfer in relation to sustainable agriculture including Climate Smart Agriculture (CSA), Good Agriculture Practice (GAP), and pre and post-harvest techniques. Youth will be strongly involved in	The private sector players active in capacity development, investment of technology innovation to adapt with the climate sensitivity (i.e. suitable agriculture equipment and machinery), improved access to quality inputs, pre- and post-harvest technologies, processing and marketing.	13, 2, 5, 12

					mitigating climate change effects.					technologies and improving stress tolerant species and variety selection, crop rotation, mixed cropping /companion planting, integrated farming system approach, Participatory Guarantee Systems (PGS), water saving techniques (drip irrigation, rainwater harvesting and storage, integrated aquaponics systems), Sustainable Rice Platform (SRP),Good Agricultural Practices (GAP), Organic Agriculture, ISNM, Integrated Pest management (IPM), water saving techniques, System of Rice Intensification (SRI), Complex Rice System (for example duck-rice farming), on-farm seed conservation and selection technics and post-harvests technologies, Sustainable landscape management (land levelling, integrated micro-watershed management).	accessibility which ultimately contribute their increase in income generation and food security. 25% increase in women in leadership positions in project activities		Sustainable Rice Platform (SRP), and Agriculture Cooperative (ACs), enterprise development and agro-business activities to ensure food security and income generation among the youth groups.		
6	**Building climate change resilience on cassava production and processing**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	Climate Change Priorities Action Plan for Agriculture, Forestry and Fisheries Sector 2016-2020	Building the resilience of country cassava production and processing for economic development, human health and environmental sustainability	Baseline: N/A Target: Cassava farmers in at least 15 provinces in the country, or more than 0.6 million hectares in cassava production (MAFF, 2018), plus the growing cassava processing industry	Mitigation: reduce pollution from processing Environmental: Prevent soil erosion Social: healthy living conditions for people in the cassava production areas	2,890,000	a). Economy of national and cassava farmers improved; b). Land erosion and soil fertility degradation minimized; c). Health of populations living in the cassava processing areas improved	1. Variety improvement program for Cassava Mosaic Virus Disease; 2. Prevention of soil erosion and soil nutrient leaching; 3. Appropriate waste management for cassava processing developed	Women have been actively involved in different phases of research and enhancing of agricultural productivity, improvement of quality and agriculture technology transfer. At least 50% of women involved in agricultural research will participate in new technology development and distribution. Women's voices and needs will be ensured along the process of the climate resilient research and technology development. Gender responsive target suggestions: # of women in leadership positions in new technology development and distribution # of women and other socially marginalized groups consulted as part of climate research # of gender analyses conducted as part of new research		Further analysis on youth involvement in cassava production, capacity and necessary resources is required. Provide capacity building based on the need, ongoing technical support, improve access to resources (financial, inputs, suitable equipment) in cassava production and processing.	Private sectors will be actively participating in capacity development, supply of inputs, improvement processing facilities and technology and exportation.	2, 5, 12, 13

7	**Research for the development and enhancement of agricultural productivity, quality, and transfer through strengthening of crop variety conservation and new crop variety release responding to the impacts of climate change**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	CCPAP 2016-2020; Strategic plan in respond to the impact of CC 2019-2023; ASDP 2019-2023.; National Demography Policy 2016-2030	Increase and stabilization of crop production through conducting research on plant genetic conservation and utilization, release of new crop varieties with high yield and quality, resistant biotic and abiotic stresses.	Baseline: 38 varieties conserved in 2019 1 new variety released in 2019 (MAFF, 2020) Target: 200 varieties conservation and rejuvenation per year; At least 2 new crop varieties released per year	Promotion of environment and conservation of natural resources	2,000,000	£3,000,000.00	More than 38 crop types/varieties are being conserved in CARDI's gene-bank and on field for long term utilization.; New crop varieties released to respond to climate change ; new crop varieties with high yielding and quality, resistant to biotic and abiotic stresses.	Women have been actively involved in different phases of research and enhancing of agricultural productivity, improvement of quality and agriculture technology transfer. At least 50% of women involved in agricultural research will participate in new technology development and distribution. Women's voices and needs will be ensured along the process of the climate resilient research and technology development. Gender responsive target suggestions: # of women in leadership positions in new technology development and distribution # of women and other socially marginalized groups consulted as part of climate research # of gender analyses conducted as part of new research		More than 50% of youths (who are involved in the proposed priorities for agricultural development sector) will be engaged to participate in new technology development and distribution. They include students, researchers, scientists, sellers and farmers.	It is important to work with all stakeholders such as farmers agricultural communities, agricultural cooperatives, SME, and Cambodian rice milling association.	2, 5, 12, 13
8	**Development of new technologies and increased yields by using new crop varieties which adapt to climate change**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	CCPAP 2016-2020; Strategic plan in respond to the impact of CC 2019-2023; ASDP 2019-2023.; National Demography Policy 2016-2030	Technology package for rice crop diversification; New upland soil classification and fertilizer recommendations; Land erosion, degradation, and soil fertility management in lowland and upland areas	Baseline: NA Target: At least 5 types of new technologies developed responding to climate change	Promotion of environment and conservation of natural resources	1,500,000	£2,250,000.00	Mung-bean grown within short duration variety (Less than 55days from planting till first harvesting) and irrigated with small amounts of water; Upland soil map development with Fertilizer recommendation; Technology transfer of rice seed purification technique for farmer level; Quality seed produced and Pre- and post-harvest technology development	Women will be engaged to participate in research and technology development. More than 50% of female farmers will benefit from capacity building and extension services in particular new technologies on crop diversification, variety selection of stress tolerant crops, and soil fertilities management in low and upland areas, pre and post-harvest technology.		More than 50% of youths (who are involved in the proposed priorities for agriculture development sector) will be engaged to participate in new technology development and distribution. They include students, researchers, scientists, sellers and farmers.	All stakeholders including farmer agricultural communities, agricultural cooperatives, SME, and Cambodian rice milling association will be engaged to be involved in developing new technologies, facilities to develop, test and demonstrate the resilience of crop varieties.	2, 5, 12, 13
9	**Development of rubber clone varieties suitable for AEZ and resilient to climate change**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	ASDP (2019-2023) and CCAP 2016-2020	Resilient rubber clone varieties suitable for AEZ in Cambodia for sustainable production and reduced maintaining cost.Rubber clone trial and experimental to produces best accessions variety by AEZ in term of resilient, good yield and rubber quality.Carbon sequestration and contribute to sound ecological function.	Baseline: 363 farmers trained in 2019 (DGR, 2019)Target: 3, 500 trained planter in 5 AEZ; at least 1 new clone variety developed	Maintain and improved rubber production and provide employment;Improvement of rubber plant genetic and fully scientifically documented;Increased revenue by reduced maintaining cost; Mitigation as rubber plantation requested CO_2e Economic growth	9,248,600	$13,872,900.00	Horticulture, Cloning and breeding, Plantation trial and analysis, Land suitability, soil improvement.	Implementation of gender sensitive extension services and promotion of women roles in value chain development. 50% of rubber producers participating in trainings are women. 50% of women beneficiary's report extension services meet their specific needs and priorities # of women report new waged positions in rubber value chain development		Ensure the engagement of at least 80 % of youth involved in the rubber production in capacity development including development rubber clone variety that are suitable for AEZ and resilient to climate change.	Private sector will be engaged in capacity development and adopt/using clone technology after training. The private sectors will be supported with rubber seeds that are suitable for AEZ and resilient to climate change.	2, 5, 13

10	**Enhancing institutional and capacity development on climate change impact, vulnerability assessment, adaption measures and mitigation related to rubber sector**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	ASDP (2019-2023) and CCAP 2016-2020	Overcome the unique challenges of rubber involved in responding to climate change it must be able to act on foresight, learn and adapt, build collaborative coalitions for action through research and/or enhance existing GAP subjective to rubber plantation practices.	Baseline: 171 sub-national/extension workers trained in 2019. Target: 5 permanent sample plots (PSP) equipped with mini weather stations; 150 well trained national technical staff, 1500 extension worker, and 30 rubber small holder association; Support to sub-national level 20 times.	Sustainable rubber production to support economic development and employment	3,852,000	$5,778,000.00	PSP (permanent sample plot) establishment, data recording and analyses technique; Good Agricultural Practices (GAP), Agroforestry, sustainable land management.	All levels of interventions will target at least 30% of women beneficiaries and 50% representation of women and men in stakeholder consultations. Equally involve participation of men and women in Vulnerability Impact Assessment (VIA) to assess the needs and constraints to ensure comprehensive gender analysis in the report. All data measuring vulnerability will be disaggregated by gender, age, location, income Include gender-sensitive indicators in the institutional development i.e. at least 30% of women will be represented in particular in leadership positions		Ensure the engagement of at least 80 % of youth involving in the rubber production in capacity development specifically on climate change vulnerability impact assessment, improvement of adaptation and mitigation measure related to rubber production.	Private sector will be involved in capacity development, planning to improve the effectiveness of adaptation measures and mitigation actions related to the rubber sector.	2, 5, 13
11	**(Program 2: Promote animal production and animal health) Improvement of animal breeding technology in Cambodia through AI which can adapt to climate change**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	Strategic Planning Framework for Livestock Development2016-2025	Strengthened climate-resilient animal breed through modern technology	Baseline: Animal breed production: 338 of Cattle breeds produced and 123347 of piglets produced in 2019. Meat production 239,115 tones in 2019 (MAFF, 2020) Target: Increase animal breed by 3%/year and meat production by 3% for 25 provinces/ year	Environmental, social and adaptation	12,500,000	Increase animals' production and meat by 3%/year; At least 1,611,646 households keeping, raising livestock will benefit from the prioritized activities in 5 different AEZs (RGC,2013)	AI, feed fodder, cooling systems and deworming, and vaccine programmes	At least 23% of beneficiaries will be female-farmers will be involved in various capacities in the development of animal breeding technologies and genetic management of animal production. They will be also engaged in animal management technology, feeding, grazing and disease management, improvement of access information, services, engagement in the roles of livestock commercialization and livestock production.		Youth represent 5% in animal production. They will be supported in capacity building and animal breeding technology to adapt to climate change. Youth engagement will be promoted through whole process of animal production value chain.	Private sector/ animal husbandry farm owners will be supported on AI technology to produce and sell high quality of cattle sperm, to improve the quality of cattle productions. They will provide technical support and extension services to smallholders for improving adaptive capacity and household production	2, 5, 13
12	**Promotion of research capacities on animal genetic, animal breeding, and animal feed is strengthened to adapt to climate change**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	Strategic Planning Framework for Livestock Development2016-2025	Strengthened research skills and Improved breeding technologies; improved vaccination.	Baseline: 16,199,864 of animal received vaccines in 2019 (MAFF, 2020) Target: get 1 vaccination after 10 years; Vaccines to reach 77%/year	Environmental, social and adaptation	50,000,000	Reduced mortality to less than 5%; expected to increase 3%/year	Animal Breeding and Feeding (AI technique, Fodder Programme), cooling systems, de-worming and vaccine programmes, Animal disease surveillance)	At least 20% of women will be engaged and improved technology literacy and technical capacity on animal husbandry. Suggested target: 20% of all beneficiaries of technology literacy on animal husbandry are women Promote women's roles as livestock ownership, care providers, feed gatherers, processors, users and sellers as a key aspect of local economic development. 50% of women beneficiaries report new assets (livestock) 70% of women beneficiaries report new skills in animal husbandry		40% of youth (animal raisers) will be engaged in research and development of animal genetic, animal breeding and animal feeding technologies (i.e. AI technology, fodder programme), cooling systems, deworming and vaccine programmes to adapt to climate change.	The private sector will play important role in replicating and piloting the technologies including improvement in animal breeding, AI technologies, cooling systems, deworming, vaccine programmes, animal disease surveillance and fodder programmes.	2, 5, 13

13	**Strengthening capacities for risk prevention and reduction, effective emergency preparedness and response at all levels; enhancing livestock and disease-related early warning system, and integrating disaster risk reduction and climate change adaptation measures into recovery and rehabilitation initiatives in the livestock sector**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	Strategic Planning Framework for Livestock Development2016-2025	Animal Health and Production cooperatives establishment and Technical guidelines for animal health and production set up, Integration with farming systems based on animal production is expanded	Baseline: NA Target: 5 Animal Health and Production cooperatives/year (150 persons/year)	Environmental, social and adaptation	6,250,000	Provide benefits to 750 farmers /year; expected increase 5%/year	Animal breed and waste trustable and acceptable technology to farmers and cooperatives	At least 60% of female animal raisers/ farmers will be engaged in capacity strengthening to prevent risk, and increase preparedness and response to climate change. 75% of women beneficiaries' report increase knowledge, inputs and technologies to respond to the changing climate Provide technical support and adaptation measures to women groups/ animal production cooperatives with veterinary services (i.e. vaccination, monitoring of diseases), credit, and other form of recovery, rehabilitation measures and market linkages. # of women's groups/animal production cooperatives benefit from project activities		5% of youth involved in animal production will be supported on capacity development particularly on risk reduction, preparedness and response to climate shocks as well as technology transfer, knowledge and skills on early warning systems and disease management. They will be also be engaged in collective businesses, enterprise development, financial accessibility and market linkage.	Promote capacity development, and technical response for risk prevention and reduction. The private sector will be also promoted to support climate adaptation measures to mobilize financial resources and technical capacity, leverage the efforts of governments, engage civil society and community efforts, and develop innovative climate services and adaptation technologies.	2, 5, 13
14	**(Program 3: Fishery management and aquaculture development) Promoting aquaculture production systems and practices that are more adaptive to climate change**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	Joint Monitoring Indicators (JMIs) 2019-2023; Climate Change Priorities Action Plan for Agriculture, Forestry and Fisheries Sector 2016-2020	Increase adaptation, strengthen livelihoods and safeguard food and nutrition security of small-scale fishermen	Baseline: 307,408 tons (MAFF, 2020)Target: Increased aquaculture yields by 20% annually	Develop aquaculture system increase production, enhance livelihoods related to food and nutrition security, reduce fishing pressure on fisheries resources	15,600,000	4,700,00026,496 households will be engaged in aquaculture production and benefits (RGC, 2013)	(i) Domesticate and produce both indigenous and exotic species that are more adaptable to climate change;(ii) Promote aquaculture in plastic ponds and composite ponds; (iii) Promote cage and pen culture in man-made reservoirs	50% of beneficiaries in improved aquaculture production are women50% of women report improved access to markets50% of beneficiaries of in farm and out farm activities are women		65.5% of youth involved in aquaculture will be engaged in construction and operations of fishponds, fish hatching, and fish marketing. They will receive support in term of technical training and capacity development in collective business, development of fishponds, hatchery facilities, selecting of brood stock, transferring, feed preparation, harvest and post-harvest technology and marketing.	Private sector engagement/cooperation in fisheries product and food safety in response to climate change and disaster risk reduction. They will be strongly engaged in the process of capacity development, input supplies (i.e. feed), trading and processing technologies and marketing.	2, 5, 12, 13, 14
15	**Promoting climate resilience in the fisheries sector**	Agriculture	Ministry of Agriculture, Forestry and Fisheries (MAFF)	Joint Monitoring Indicators (JMIs) 2019-2023; Climate Change Priorities Action Plan for Agriculture, Forestry and Fisheries Sector 2016-2020	Sustainable use of fisheries resources and Increase adaptation, strengthen livelihoods and safeguard food and nutrition security	Baseline: 0? Capture fisheries production from all sources sustained to around 600,000 metric tons annually	Develop fishes and aquatic habitats, sustain fish yields, strengthen food and nutrition security	33,500,000	53,000,000 680,311 households engaged with fishing activities will benefit from the intervention (RGC,2013)	(i)Dredging and rehabilitation of fish refuges and critical habitats; (ii) Protection of flooded and mangrove forests as the spawning, nursing and feeding habitats for fish and other aquatic animal	50% of participants in rehabilitation of fish refuges and mangrove forest are women 50% of beneficiaries receiving extension services are women 50% of women beneficiaries have successfully been approved for loans (or credit services) and gained access to fisheries resources		30% of youth involved in fishery sector will be engaged in consultation meetings, engaging sustainable fishery management and protection the critical habitats and mangroves and flooded forests.	Private sector will be engaged in protection of flooded forests and reforestation activities for example with the incentives for ecosystem services certification scheme or as a part of Social Corporative Responsibilities activities.	2, 5, 12, 13, 14,15

16	**Scaled up climate-resilient agricultural production through increased access to solar irrigation systems and other climate-resilient practices**	Agriculture	National Council for Sustainable Development (NCSD)	INDC: Developing climate-proof agriculture systems for adapting to change in water variability to enhance crop yields	Strengthen the adaptive capacities of smallholder farmers and coastal communities, especially women and most vulnerable groups, to cope with impacts of climate change induced challenges on their livelihoods as well as on water-energy- food security.	Baseline: 0 30 communes of 7 provinces namely Takeo, Pursat, Battambang, Siem Reap, Kampong Thom, Kandal and Prey Veng with integration of climate change into financial management, institutional arrangement and policy reform by 2030	1. GHG emission reduction through solar irrigation 2. NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	10,000,000	17,000,000	Solar water pumps Medical cold chain	Improved access to sustainable agriculture and medical cold chain for food security and better health services for women and men in vulnerable communities as well as safe drinking water for coastal communities Target: 30% of beneficiaries receiving cold chain services (for food storage) are women 50% of all project beneficiaries reporting access to safe drinking water are women			Will be important to engage with the private sector in the agriculture and energy sectors to ensure adequate capacity.	2, 5, 6, 7, 13
17	**Developing a training manual and providing training on approaches for development of climate-smart and sustainable livelihood to rural poor people**	Agriculture	Ministry of Rural Development (MRD)	-Rectangular strategy -NSDP -MRD Strategic Plan	Building adaptive capacity of rural poor people for better living standards	Baseline: 0 2,000 Rural poor People (Poor 1, & Poor 2).	Adaptive capacity of rural poor people will contribute to livelihood promotion and environmentally friendly	10,000,000	Poor villagers will change their behavior and attitudes in working hard for their betterment of their livelihoods and communities	Lessons learnt and best practice from other countries can be applied.	In poor villagers both men and women participate in training program . Target: 50% of program beneficiaries are women	Conditional	Youth among the poor family (15-35 years old) are engaged		1, 2, 5, 13
18	**Protection, risk mitigation, and resilience building from marine pollution particularly caused by activities on land including marine pollution from waste and aquaculture activities.**	Coastal zones	Ministry of Environment (MOE)	NSDP	Effective coastal zone management resilience to climate change as well as projection of other impacts that caused by human activities	% of coastal pollution reduction through marine conservation activities % of coastal pollution reduction through solid waste management of the 4 coastal cities and provinces % of coastal pollution reduction through waste water management of the 4 coastal cities and provinces	Mitigation: reduce GHG emission from waste in ocean Biodiversity of marine resources	2,000,000				Conditional			5, 13,14
19	**Effective management and protection of ecological systems of marine and costal zones to avoid adverse impacts from various factors, build their resilience and restore its functions for productive and healthy oceans**	Coastal zones	Ministry of Environment (MOE)	NSDP	Resilience of coastal zone through restoration of its functions that will reduce the impacts from different factors including climate change	Main function and services of marine and coastal zone ecological system is protected and restored by 2030 % of flooded forest and mangrove which will be restored and protected	GHG emission reduction through restoration of mangrove and improvement of ocean capacity to capture the carbon from atmosphere	70,000,000		Construct the baseline data for economic value of ocean ecology Preparation of documents for collection of ocean ecological services GHG inventory of mangrove Selection of mangrove species resilient to climate change Preparation of mechanism, protection and management of protected area		Conditional			5, 13,14

20	**Upgrading curriculum and training methodologies, including libraries, to include climate change subjects for primary schools**	Education	Ministry of Education, Youth and Sport (MOEYS)	1. Cambodia National Adaptation Plan Financing Framework and Implementation Plan for MoEYS, p242. CCCSP2014-2023a) Enhance the implementation of Article 6 of the UNFCCC on education, training, awareness, participation and access to information by the people, and inter-national cooperation for climate change response.b) Integrate climate change into curricula for all levels of education.c) Develop targeted awareness programmes aimed at key audience such as most-vulnerable groups, women, children, youths and minorities.3. Curriculum framework 2016a) Enhance the implementation of Article 6 of the UNFCCC on education, training, awareness, participation and access to information by the people, and inter-national cooperation for climate change response.b) Integrate climate change into curricula for all levels of education.c) Develop targeted awareness programmes aimed at key audience such as most-vulnerable groups, women, children, youths and minorities.3. Curriculum framework 2016	Strengthen resilience through education in order to respond to related climate disasters by: 1. Developing the supplementary documents for supporting teaching and learning at school levels.2. Increase nationwide Eco-school.3. Integrate CC into Khmer, Science and Social study subjects.	1. Develop and implement the supplementary documents (from primary to secondary)2. Increase the Eco-school from 10 to 1000 schools.3. At least 8000 schools across the country will increase awareness about CC thought Khmer, Science and Social study subjects	Students shall understand:1. Climate change mitigation2. Pollution.3. Biodiversity 4. Environment conservation5. 5Rs.	2,000,000	2,500,000	Textbook ratio for primary, lower secondary and upper secondary schools	Increase percentage of girls for:1. Enrollment rate2. Promotion rateTarget: 47.9% for girls by 2023	Textbook publication-unconditional (National budget partners)Others: Conditional	Field testing for curricula and textbook		4, 5, 13

21	**Upgrading curriculum to include climate change for non-formal education**	Education	Ministry of Education, Youth and Sport (MOEYS)	1. Cambodia National Adaptation Plan Financing Framework and Implementation Plan for MoEYS, p24 2. CCCSP2014-2023 a) Enhance the implementation of Article 6 of the UNFCCC on education, training, awareness, participation and access to information by the people, and inter-national cooperation for climate change response. b) Integrate climate change into curricula for all levels of education. c) Develop targeted awareness programmes aimed at key audience such as most-vulnerable groups, women, children, youths and minorities. d) Policy of Non-Formal Education 2002 e) National policy on lifelong learning	Strengthen resilience through education in order to respond to related climate disasters by: 1. Develop the supplementary documents for support teaching and learning at school levels. 2. Increase nationwide Eco-school. 3. Integrate CC into Khmer, Science and Social study subjects. 4. Mainstreaming NFE curriculum, such as literacy program, income generation program (community learning center) and Equivalency program in response to climate change 5. Integrate into national action plan on lifelong learning	(2020-2030) Increase the update of CLC from 17 in 2020 to 145 LLC in 2030	Students shall understand: 1. Climate change mitigation 2. Pollution 3. Biodiversity 4. Environment conservation 5. 5Rs.	950,000	990,000	1. CLC Standard 2. Criteria for ranking CLC	Increase percentage of girls for: 1. Enrollment rate 2. Promotion rate Target: 30% for girls by 2023	Textbook publication-unconditional (National budget+partners) Others: Conditional	Field testing for curriculum and textbook		4, 5, 13
22	**Build centers of excellence for delivering climate change courses and research among Universities**	Education	Ministry of Education, Youth and Sport (MOEYS)	1. Cambodia National Adaptation Plan Financing Framework and Implementation Plan for MoEYS, p24 2. National Action Plan 2017 Development of knowledge and information system on climate change 3. CCCSP2014-2023 4. Enhancing knowledge management related to climate change adaptation and promoting innovation that is needed based 5. Develop a 'knowledge management center' for facilitating access to up-to-date information for climate change responses	1. Strengthen climate-resilience education through innovation, research and data management center. 2. Document lessons learn and best practices for climate resilience development to share among practitioners	Baseline: 1 Target: 3 centers of excellences in 2023 as mentioned in the ESP target and increase to 7 in 2030	1. Climate change mitigation 2. Pollution reduction 3. Biodiversity 4. Environment conservation 5. 5Rs.	3,250,000	3,300,00	Standards and criteria of center of excellence	Target: 25% of all new course spaces are allocated to women Develop gender safeguard guidance and best practice for climate change		Engage youth in all aspects including research, curriculum, etc.…	Engage private universities to be centers	4, 5, 13

23	**Conduct training for education officials on climate change e.g. as a required component of teacher training**	Education	Ministry of Education, Youth and Sport (MOEYS)	1. Cambodia National Adaptation Plan Financing Framework and Implementation Plan for MoEYS, p24 2. CCCSP2014-2023 3. Strengthen education quality of teachers and build capacity of planning officers on teaching and learning methodologies of climate change	Strengthening climate-resilient education through capacity building and institutional strengthening	Baseline: No data available Target: 60% of teachers primary and secondary trained on climate change concepts.	1. Climate change mitigation 2. Pollution reduction 3. Biodiversity 4. Environment conservation 5. 5Rs.	900000	950,000	Training assessment Capacity Development Assessment tool	Target: 46% of all trainees are women	Conditional	Engage youth in all aspects including research, curriculum, etc.	Engage private universities to be centers	4, 5, 13
24	**Conduct climate risk analysis for the existing electricity infrastructures and provide recommendations**	Energy	Ministry of Mines and Energy (MME)	National Adaptation Plan Financing Framework and Implementation Plan, p. 24 for MME	Strengthen climate-resilient energy through electricity infrastructure improvement in order to respond to climate related disasters.	Baseline: 0? 1. Vulnerability assessment of existing 5 power plants 2. Vulnerability assessment of the existing 1000km of national power transmission network	1. Forest fire prevention and biodiversity protection 2. Local community safety and life protection 3. Water and air pollution	322,000	500,000	Adapting the Energy Sector to Climate Change by International Atomic Energy Agency (IAEA) A Framework Strategy for a Resilient Energy Union with a Forward-looking Climate Change Policy by EU Climate Change Vulnerability Assessment by X?	Include gender indicators and identifying the adaptation options by women in climate-resilient energy sector # of gender analyses conducted as part of climate risk analysis for electricity infrastructure 50% of stakeholders consulted should be made up of socially marginalized groups, such as women, the elderly, the disabled, remote communities, indigenous communities				5, 7, 13
25	**Climate proofing of existing and future solar/hydropower infrastructure**	Energy	Ministry of Mines and Energy (MME)	Increase storage capacity by adjust water release schedule to maximize generation	Amplified by runoff conditions, the resulting change in water availability determines whether power output is reduced or increased	-	-	-	-	-	Gender analysis forms part of the analysis for scoping and feasibility studies for solar/hydro infrastructure Stakeholder consultations will include women and women's groups, the disabled, the elderly, indigenous groups and all local communities impacted by the proposed infrastructure				5, 7, 13
26	**Strengthen institutional capacities at national and sub-national levels to integrate gender responsiveness in climate change adaptation's policies, plans, programming, including gender budgeting**	Gender	Ministry of Women's Affairs (MOWA)	- Mainstreaming Gender and Climate Change Strategic Plan 2014-2023-Neary Ratanak V, MoWA- GCCC 5 years plan, MoWA	Optimize the implementation of policy, action plans, programs of gender mainstreaming in climate change adaptation at national and sub-national levels	Baselines:1.1.1. Baseline: 2,352 local community members, including 1,771 women1.1.2. 7 coordination meeting conducted with line ministries 1.2.1. Baseline: 0Targets:- Five Sectoral Ministries such as Agriculture, Health, Education, Water resources and Rural development (wash management) has mainstreamed gender in their own policy plan and programme of climate change adaptation in 2030- Officials of relevant ministries have the capacity to mainstream gender into climate change adaptation policy plan and programmes in 2025	Improve gender equality, Gender responsive action, Gender responsive budgeting in policies planning of action and programmes	500,000	600 000US$	Technology is well available	25% of VCMG and CCDM DCDM, PCDM and NCDM50%,50% participants are female/male Women leaders and women civil servants participated in the formulation, implementation and implementation of climate change adaptation policies at national and sub-national levels.Gender response/mainstreamed into climate change adaptation policy Plans and Programmes at national and sub-national levels # of polices and plans have gender mainstreamed with appropriate gender indicators and resources allocated	Conditional MoWA prefers to implement this actions base on available fund (small CCCA support)	Could be good to incorporate youth as community volunteers		5, 13

27	**Enhance coordination and implementing accountability mechanisms to reduce climate change vulnerabilities of disadvantaged women and other marginalized groups such as ethnic minority women and men, People with Disability (PWD), youth, and elderly**	Gender	Ministry of Women's Affairs (MOWA)	- Mainstreaming Gender and Climate Change Strategic Plan 2014-2023 - Neary Ratanak V, MoWA - GCCC 5 years plan, MoWA	-Increase the effectiveness and accountability of coordination mechanisms between ministries, institutions, civil society, development partners and the private sector in reducing vulnerability of women and other vulnerable and marginalized groups. -Women, vulnerable groups and other marginalized groups have an ability into Climate change adaptation	Baseline: - 7 coordination meeting conducted - MOWA strengthened the institutional capacity by producing gender mainstreaming policy documents, trained respective officials - GCCC conducted sex-disaggregated baseline - Four pilot projects on agriculture, water, health and infrastructure to demonstrate how gender responsive and gender equitable climate change adaptation investment Targets: - Mechanism and accountability of coordination mechanisms between ministries, institutions, civil society, development partners and the private sector to reduce the vulnerability of women, vulnerable groups and other marginalized groups by at least 40% by 2030 - Women, vulnerable groups and other marginalized groups have the ability to adapt to climate change by at least 20% by 2030	Increase collaboration with Ministries, institutions, civil society, development partners and the private sector in an efficient and accountable manner Extending the scope of partnership building Increase the family economy, food and nutrition Security	50,000		Technology is well available (ITC, Social media…….)	Target: 50%/50% participants are female/male Stakeholder consultations include representatives of differing social groups, women, the disabled, the elderly, the indigenous and ethnic minorities Women represent 25% of decision makers in sub national climate change committees -Promote gender equality, and innovation -Leave no one behind -Women empowerment -Women in leadership	Conditional			5, 13
28	**Enhance monitoring and evaluation systems of sectoral ministries to track gender outcomes in climate change initiatives with particular focus on collecting and managing sex-disaggregated data, gender indicators and budgeting, outcome-based reporting, and dissemination and up-scaling of the gender and climate change adaptation related knowledge generated.**	Gender	Ministry of Women's Affairs (MOWA)	- Mainstreaming Gender and Climate Change Strategic Plan 2014-2023 - Neary Ratanak V, MoWA - GCCC 5 years plan, MoWA	Develop and strengthen the effectiveness of the collection and management of gender-disaggregated data, performance-based reporting, dissemination and promotion of gender-sensitive knowledge in response to climate change adaptation.	Baseline: 0 Targets: At least five key sectoral ministries have developed and implemented an M&E system to monitor gender outcomes in climate change initiatives by 2025. By 2030 at least ten sectoral ministries have developed and implemented this M&E system	-Gender Responsive M&E -Reducing Gender Gap in social environment	200,000		Technology in the design and implementation of gender performance monitoring and evaluation systems of climate change adaptation initiatives	Women leaders have supported female civil servants in collaborating with key sectoral ministries in the design and implementation of gender performance monitoring and evaluation systems in climate change adaptation initiatives. Gender and age disaggregated data on the impact of climate change is collected 50% of all new studies and report collect and use gender and age disaggregated data	Conditional NCSD has fund for system and training as part of Enhanced Transparency Framework Implementation			5, 13

29	**Capacity development for GCCC members and sectoral ministries on gender analysis, gender responsive and NDC**	Gender	Ministry of Women's Affairs (MOWA)	-Mainstreaming Gender and Climate Change Strategic Plan 2014-2023 -Neary Ratanak V, MoWA -GCCC 5 years plan, MoWA	Builds effectively and optimize of capacity for members of GCCC and sectoral ministries on Gender analysis, gender responsive and NDC	Baseline: 3 training session conducted with 357 persons, including 189 (53%) women Targets: 20 members of GCCC and 24 officers from sectoral Ministries developed capacity on Gender analysis, gender responsive and NDC in 2025 This activity target only gender and NDC. The target group is GCCC member (around18 participants/each)	Capacity development Promotion of gender in social inclusiveness Reduction of gender gap in social environment	400,000		Technology is well available	Target: 50% participants in capacity development are female Women participate in capacity development	Conditional			5, 13
30	**Develop a technical guidelines for gender mainstreaming in NDC process**	Gender	Ministry of Women's Affairs (MOWA)	- NDC Roadmap and stakeholder engagement plan 2019-2030 - Mainstreaming Gender and Climate Change Strategic Plan 2014-2023 - Neary Ratanak V, MoWA - GCCC 5 years plan, MoWA		Baseline: 0 Target: A Technical guideline for Gender mainstreaming in NDC process has developed and launched in 2025	Mainstreaming gender and social inclusion in NDC Analysis of gender integration in NDC (both adaptation and mitigation)	120,000		Gender-responsiveness restoration in NDC process	Target: 50% participants are female	Conditional			5, 13
31	**Market supply chain of rural women entrepreneurs resilient to climate change**	Gender	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: 1. Leverage the decentralization process to strengthen financial and institutional processes for local adaptation 2. Mainstream climate change into national and sub-national development plans and the NSPS	Strengthen climate-resilient communities though local business supplier of clean energy and green technology	Baseline: Testing in Takeo and Pursat (4 districts) Target: 25 communes of 3 provinces namely Takeo, Kampong Thom, and Prey Veng with integration of climate change into financial management, institutional arrangement and policy reform by 2030	1. Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission 2. NCDD will also implement ESS, Gender, M&E along with climate action 3. Builds market capacity of rural women entrepreneur in the context of climate resilient and DRR	8,000,000	13,000,000	1. Climate change governance 2. Climate vulnerability and impact assessment for 25 target communes 3. Climate Change Index Solar for hatching and heating, solar pumping station.	Target: 60% women report increase in income and access to markets: 1. Promote inclusiveness, gender equality, and accountability by engaging more women in institutional arrangement for climate change 2. Cambodia Gender and Climate Change Action Plan 3. Policy on gender for sub-national democratic development	Conditional		Supplier of green technology and solar application	2, 5, 7; 13
32	**Local government and Climate Change-III (LGCC3)**	Governance	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023:1. Leverage the decentralization process to strengthen financial and institutional processes for local adaptation2. Mainstream climate change into national and sub-national development plans and the NSPS	Strengthen climate-resilient local governance through financial, institutional, policy and strategic plan reform in order to respond to current and projected climate hazards and prevent from loss and damage due to hazard	Baseline: 8 districtsTargets: 90,000 Direct Beneficiaries equivalent to 3% of total population by 2026	1. Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission2. NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards3. Create enabling environment for local solution to address climate change	13,185,000	14,000,000	1. Climate change governance2. Climate vulnerability and impact assessment for 20 target communes3. GCF funding modalities and investment criteria standard4. NCDD accreditation standards	Target: 30% of participants in the institutional arrangements are womena. Promote gender equality by engaging more women in institutional arrangement for climate change	(Co-financing: 10,000,000 from GCF) Conditional	Volunteers in agriculture, public health and environment	Service providers: capacity building, infrastructure & construction	5, 13

33	**Reducing vulnerability of local communities though sub-national climate governance reform (focusing on policy)**	Governance	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: 1. Mainstream climate change into national and sub-national development plans and the NSPS 2. Strategic Plan on Capacity Development for civil servant of MoI and human resources at sub-national level (2019-2023): Strategy 1: Improve efficiency of capacity building program	Strengthen local climate solution to respond to climate hazards through: 1. Improved awareness, capacity and skills 2. Adaptation planning is integrated in sub-national planning 3. Local adaptive infrastructure and service	Baseline: National policy to be transferred to sub-national administration: climate change, waste management, public health, education, water resource, agriculture, rural development, climate change adaptation planning (Sub-national climate change adaptation-NAP) Target: 40% of total population by 2030	1. NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards 2. Create enabling environment for local solution to address climate change	10,000,000	10,500,000	1. Capacity building program develop for civil servants of MoI 2. GCF funding modalities and investment criteria standards 3. NCDD accreditation standards	Target: 30% participation of women in the process The component of project output to be aligned with Policy on Promotion of Gender Equality for Sub-national Democratic Development of NCDD	Conditional	Consultation with NGOs which focus on youth	Develop policy which include PPP for relevant sectors in sub-national adaptation planning	5, 13
34	**Enable effective decision-making for health interventions through generation of information and improved surveillance or early-warning systems**	Human health	Ministry of Health (MOH)	1. Train health care providers on reporting & data surveillance 2. Strengthening clinical diagnostic (rapid usage guideline development) 3. National Action Plan for Dengue and other Arboviral Disease Prevention and Control 4. SOP for dengue surveillance system	1. Strengthen climate-resilient health program to respond to health risk posted by climate change 2. Dengue sentinels expansion	Health care providers working with dengue and other water-borne disease Baseline: 5 existing provinces (Siem Reap, Takeo, Kampong Cham, Battambang, and Kampot) New selected sits: Kampong Thom, Kampong Chhnang, Kratie, Preveng, and Tbong Khmom. Target: 11 for dengue for unconditional (2020-2023) 15 entomological centennial site (2023-2030)	-Social: improve health care system and enable remote village to have proper access to healthcare -Indirect: reduce risks of life-lost and losing money on long-distance travel to healthcare -To reduce of time lag on reporting number of case to the National Level - Reduce diagnostic errors	113,519		- CamEWARN - HIS - Climate change risk: vulnerability assessment - National Dengue Surveillance System	Target: 40% of decision makers at the local and sub national level are female Risk assessment on the impact of dengue fever to women and men to understand the disproportionate impacts Identify age of patients, children, adult. Gender and age disaggregated data will be collected	Conditional	Youth could engage through campaign/ awareness at least 40% are youth (15-35 age)	2023-2030 (15% of participants are private sector) Dengue stakeholder (clinic) are also from private sector. MoH have engaged clinic into actions through capacity building and awareness campaign	3, 5, 13
35	**Enhance climate resilience in health service delivery**	Human health	Ministry of Health (MOH)	1. Develop rural water safety planning 2. WASH Assessment tools development for health care facilities and communities 3. Establishment of technical working group for CC on Health at Ratanakiri	1. TWG-Meeting on WASH-Health Care Facilities related to Climate Change 2. The assessment was conducted at 25 health centers in Ratanakiri 3. The assessment was conducted at communities in three districts, 15 communes, and 75 villages.	Baseline: 25 Health Centers and 15 Communities 75 villages in Ratanakiri (water sanitation) Target: 100 Health Centers and 60 Communities and 300 villages in 4 vulnerability province on climate change Baseline: 277person/ 9 trainings/6province) Target: 810particpants/27 trainings/ 18 provinces/municipality Baseline: 90 Participants/3Training from 5 provinces) Target : 150/ 5 Training/ 15 Province/Municipality	1. Community has better planning to maintain a reliable, safe supply of water, sanitation 2. Community hygiene can prevent diseases as-well-as can lower death rates. 3. Improving quality of care through water, sanitation and hygiene in health care facilities 4. Reduce environmental pollution through proper waste management	246,758		- Paper based survey, Emailing, Telegram, Mobile phones	Target: 40% project beneficiaries of health services are female Reduce challenges for women and girls in access to water 50% of women report increased access to water for themselves and their families as a result of project activities		Youth could engage through campaign/ awareness at least 40% are youth (15-35 age)	Private sector could support by participation in training workshop or activities	3, 5, 6, 13

36	**Strengthen and provide capacity building of technical guidelines for diagnosis, detection, control, prevention and treatment of vector-borne and water-borne diseases, injuries and other food poisoning illnesses arising from climate change**	Human health	Ministry of Health (MOH)	Clinical Diagnosis - Vector-borne: National guideline for Clinical Management of Dengue (WHO's funded, 2018 - Water-borne: +Leptospirosis, +Schistosomiasis Endorse Pending Melioidosis, Endorsed	Treatment for water-borne and vector-borne diseases related to climate change are strengthened	-HC, HP, RHP	Capacity for health professionals improved to identify and treat climate-sensitive health issues			Emailing, Telegram, Mobile phones	Reduce health impact of climate change for women Conduct a study on the differentiated impacts of vector borne and water borne diseases on women and men, girls and boys. Based on these results, update guidelines which focus on women (or men's) vulnerability and role in control and prevention of vector borne and water borne diseases and ensure women and men equally play a role in diseases management. Suggest target: # of women and # of men reporting they have new knowledge and skills on how to prevent and control vector and water borne diseases in the home and at their workplace 50% of project beneficiaries receiving support to manage vector borne or water borne diseases are women	Unconditional			3, 5, 6; 13
37	**Conduct water sanitation and hygiene (WASH) assessment on climate change and develop planning for communities and health facilities.**	Human health	Ministry of Health (MOH)	Putting Health Data in to CAMDI, NCDM	Broadcasting and publishing health data related to CC in the public	Public awareness	Population			Emailing, Telegram, Mobile phones	Reduce health impact of climate change for women Gender, age, disability status and location disaggregated data are included in health databases	Unconditional			3, 5, 13
38	**Strengthen institutional capacities to effectively integrate climate risks and adaptation options in health sector planning and implementation**	Human health	Ministry of Health (MOH)	- Capacity building for government staff (National and Sub national) on climate change and health - Sharing Weather data with National Dengue Control Programme - Strengthen Capacity of Climate Change Technical Working Group - Update climate change curricular in university courses (Draft: Syllabus) -Climate Change Vulnerability assessment in health facilities and communities	- TWG Meeting on Development syllabus Climate Change for Health to integrate into master's Degree of CC - Strengthening Climate Change Adaptation and Disaster Management for health	Baseline: 1 RTK (water sanitation and hygiene) - Key national and provincial staff at Ministry of Health and other key ministries - Master's degree of climate change students of Royale University Phnom Penh, pursuing environmental health courses. Baseline: 1 education institution (RUPP, UHS, NIPH) (for climate change mainstreaming) Target: 2 public university (UHS & NIPH) Target 4 provinces (Kratie, Preh Vihear, Tbong Khmom and Prey Veng)	-Capacity of health personnel improved to identify and treat to climate-sensitive disease	107,408		- Climate change website for Department of Preventive Medicine - Emailing, Telegram, Mobile phones	Target: 40% of beneficiaries of health sector initiatives are women Women make up 30% of decision-making positions in local and sub national planning for health sector initiatives Reduce health impact of climate change for women and children especially marginalized community women and people with disability	2020-2023 unconditional 2023-2030 conditional	Youth could engage through campaign/ awareness at least 40% are youth (15-35 age)	Private sector could support by funding or material support participant in training workshop	3, 5, 6, 13

39	**Heat stress adaptation for industrial production**	Industry	Ministry of Industry, Science, Technology and Innovation (MISTI)	Heat stress mitigation and adaption are aligned with the following plans/actions:- Addressing Climate Change Impacts on Economic Growth in Cambodia, MEF and NCSD 2019- Promoting Private Sector Contribution to the Climate Change Responses in Cambodia, NCSD 2016- Cambodia Climate Change Financing Framework, MoE 2015- Cambodia Industrial Development Policy 2015-2025, RGC 2015 - The Cambodia Decent Work Country Programme (DWCP) 2019-2023, RGC and ILO 2019	In 2050, reduced labour productivity accounts for 57% of all loss and damage. It affects all sectors but is particularly high in manufacturing and constructionFactories can improve their resilience to heat stress by: - Permitting flexible working schedules during periods of heat stress so that workers avoid working under high temperatures- Improving working conditions in factories such as supplying water, ventilation, regular breaks, and adapting work wear - Introducing mechanization to avoid heavy manual labor during periods of heat stress	Baseline: Projections show that heat stress will cause an average reduction in productivity in Cambodia, across all sectors, of 6.54% by 2055 under a worst-case climate change scenario. This NDC aims to increase the focus on adaptation to avoid loss and damages caused by heat stress, including reduced labor productivity. Around 86% of industrial workers are employed by the garment, textile, and footwear (GTF) sector. Target: The adoption of heat stress adaption actions in GTF factories could benefit up to 800,000 workers, reducing their exposure to health risks and increasing their productivity.	Promote more labour efficient farming systems with flexible farm work scheduling; improved working practices on construction sites; better working conditions in factories (e.g. ventilation, drink breaks, more flexible schedules during heatwaves …); improved understanding of risks amongst workers and employers; improved forecasting and measurement of heatwaves; and planning to protect supply chains from heat stress	The investment costs for this adaptation action has to be calculated for implementing a combination of following aspects:1. Costs involved in retrofitting the workplace, industries and factory floors2. Investment costs for either adding or improving specific amenities to the workplace3. Costs for training and capacity-building for the workforce	Under BAU, by 2050, reduced labour productivity accounts for 57% of all loss and damage from climate change. It affects all sectors but is particularly high in manufacturing and construction		'- Women account for 25% of the industry workforce and around 85% of GTF workers, Cambodia's largest industrial sector. Adaptive actions to reduce heat stress in occupational settings, such as GTF factories, will significantly affect women due to their high participation. - Heat stress can lead to heatstroke and may even have a fatal outcome. Heat stress adaption actions will improve public health by reducing exposure to dangerous temperatures and working conditions75% of women workers report improved working conditions			The private sector will play a large role in driving adaption actions, motivated by labor productivity and associated profits, but the government can provide support through raising awareness, information, advice, and policy implementation. Depending on the actions, other government entities and actors will need to be involved.	3, 5, 8, 9, 13
40	**Enhance the quality of broadcasting means and expand the capacity of coverages for raising awareness on climate change nationwide**	Information	Minister of Information (MOINF)	-National AdaptationPlan FinancingFramework 2017 - Cambodia Climate Change Strategic Plan (2014-2023) -Ministry of Information Strategic Plan	-Increased knowledge and level of awareness among the public on climate change so they can prepare in a timely manner should any catastrophe occur. -Increased participation among public in environmental protection. - Well-informed people on climate change able to change their living attitudes and strengthen their capacity towards climate change adaptation. -Promote access to information among the public on climate change.	Broadcast/disseminate climate change policies, action plans and information via existing government media agencies to reach out to 80% of total population. Baseline: 60% (national radio), 50% (TVK) Target: Coverage all province and area in Cambodia through digital broadcasting means	-GHG mitigation -Environmental protection -Forest protection -Biodiversity conservation	5,000,000	80% of population is well-informed about climate change and its adaptation. CBA analysis would be conducted	-TV -Radio -Website -App -Social -Media	Women groups at home able to receive timely climate change information and able to respond accordingly. 50% of women reported an increase in available and timely climate change information 50% of women reported ability to make their own decisions based on available and timely climate change information # of Women groups that have the capacity, information and skills to actively participate in environmental protection		Youth issues will be promoted	Private sector would introduce the new technology, providing fund, develop broadcasting station	4, 5, 13

41	**Training and enhancing human capacity on climate change in information sector**	Information	Minister of Information (MOINF)	-National Adaptation Plan Financing Framework 2017 -Cambodia Climate Change Strategic Plan (2014-2023) -Ministry of Information Strategic Plan	-Increase the capacity of media officials and journalists so they are enabled to covers/report on climate change issues in an accurate and professional manner.	Baseline: 4 capacity buildings and training workshops on climate change have been conducted in Phnom Penh, Preah Sihanouk and Battambang Province. (approx.: 50 person) Targets: -Organize 20 Workshops/Seminars -Conduct 20 training -Organize 10 study exchanges	-GHG Mitigation -Enhance journalistic professionalism - Reduce the spread of disinformation	750000	100 media officials and 200 journalists participate in these programs	Face to face or Virtual (Webinar)	Encourage and empower female media officials and journalists to participate in these programs. Target: 30% of training recipients are female 75% of training recipients report increased skills to report on climate change issues	Conditional	Participants could be youth (age between 15-35)	Journalists and private broadcasting media organization are invited to participate in these trainings The experts from line ministries specially MoE are invited to be a resource person.	4, 5, 13
42	**Urge private media organizations to participate in covering/broadcasting the climate change topics and to complement the state broadcasting agencies.**	Information	Minister of Information (MOINF)	-National Adaptation Plan Financing Framework 2017 -Ministry of Information Strategic Plan	-The participation of private media organizations enabled to expand the capacity of coverages to remote and vulnerable areas. -Strengthen cooperation and experience sharing on climate change broadcasting between public and private media organizations.	Baseline: No baseline available. There were several private media organizations such as CBS, Hang Meas and Bayon collaborating with Ministry of Information so far. Target: 90% of private media organizations including Electronic, Traditional and Online media participate in climate change broadcasting campaigns.	-Reduce cost of climate risk -informed society and active citizens -GHG Mitigation Environmental protection -Forest protection -Biodiversity conservation	1250000	80% of population is well-informed about climate change and its adaptation implications	-TV -Radio -Website -App -Social Media	Target: 30% of those interviewed report increased awareness of climate change are women Women groups living in remote and vulnerable areas are able to receive comprehensive news on climate change and actively participate in environmental protection.	Some cases need funding	News anchors/hosts who majority are youth working at media organizations play a vital role to encourage/ promote the public on Climate Change adaptation	Collaboration with private media organizations. Support private media organization on technical, specialist and funding.	4, 5, 13
43	**Urge and encourage to reduce (or ban) all forms of commercial advertisement that has negative impact on environment**	Information	Minister of Information (MOINF)	-Ministry of Information Strategic Plan	Discouraging (or banning) all forms of commercial ads that effect climate change is a direct and effective respond	Baseline: 0 Target: Encourage the public to consume products or goods that are not harmful to the environment and reduce the commercial ads of any product or good that has negative impact on environment to minimum. MoInfor will provide advise/counsel to media organizations to study the pro and con of the goods/services before accepting for advertisement	- Reduce cost of climate risk -GHG Mitigation Environmental protection -Forest protection -Biodiversity conservation	500000	Minimizing commercial ads of any products/goods that has negative impact on environment	-TV -Radio -Website -App -Social Media	Target: 30% of people that report changing behaviour as a result of advertising are women Encourage women group to consume all products or goods that are do not harm the environment.	Unconditional	News anchors/hosts who majority are youth working at media organizations play a vital role to encourage/ promote the public on Climate Change adaptation	Urge for participation/ collaboration among media organizations in this campaign (Private agencies is a target)	4, 5, 13

44	**Integrating climate change response measures onto the construction design for buildings and for rural housing (use of modern integration of technology)**	Infrastructure - Buildings	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	Strategic National Action Plan for Disaster Risk Reduction in Cambodia 2008-2013	Strengthen regulation and capacity for construction sector especially/including in the coastal zone locations to adaption to climate change.	Baselines: 0- By 2030: Development of Technical Climate Change Toolkit s for Mainstreaming Climate Change Measures and formulation of Climate Change Toolkit s for coastal area management for both land use, building and housings- By 2025: All (200 Engineers) Building Planner and Designer Received Capacity Building on Kits - By 2026: At least 30% of building permits are fully followed the Toolkits By 2030: At least 60% of Building Permits are fully with toolkit s elements - By 2026: Infrastructure and building development in one coastal zone is designed and mainstreaming through climate change toolkit s against sea water rise, tidal, and waste water management storage - By 2050: Infrastructure and building development in two coastal zones is designed and mainstreaming through climate change toolkit s against sea water rise, tidal, and waste water management storage (conditional)	1. Stakeholders (designer, user, and building commercial owner) are aware of the risks and potential impacts of environment posed by variability in weather patterns and observed and projected climate changes on the different types of building construction2. Environmental Risk Management and Mitigation is created because the construction equipment operations consume a lot of natural resources, such as electricity and/or diesel fuel. 3. The measure includes enacting strict laws to enforce institutions to make environmental impact assessment (EIA) in the early stage of projects, and enhancing the awareness of construction participants with regard to impacts of construction in the environmentThe results also revealed that "search about alternative methods for construction to mitigate the adverse impacts of construction on the environment" was ranked in the second position with regard to proposed solutions to mitigate the environmental impacts of construction.	3,400,000	Benefits: according to the CPEIR, climate related investment for construction sector is about $300,000 per year.		Restoration can be a crucial opportunity for women economic empowermentTarget: 20% of poor women headed household access to climate change resilient housing20% of all beneficiaries involved in construction design are women		Provide inputs in construction design as they are the main input providers for MLMUPC	Full engagement of private sector in construction sector is needed	5, 9, 13

45	**Develop resilient infrastructure of school buildings in response to climate change**	Infrastructure - Buildings	Ministry of Education, Youth and Sport (MOEYS)	1. Cambodia National Adaptation Plan Financing Framework and Implementation Plan for MoEYS, p24 2. National Adaptation Plan 2017 3. Promote climate proofing and retrofitting of existing and planned schools and university infrastructure 4. ESP 2019-2023: a) Strategy 1.2: Develop physical infrastructure with clean and safe learning environments in line with primary school standards, especially for incomplete and disadvantaged schools (p29) b) Strategy 1.3: Expand physical infrastructure and facilities for secondary schools (p36)	Strengthen climate-resilient education through infrastructure development in order to respond to climate related disasters such as temperature increase, drought, flood, storms and lightning.	Baseline: 5 Target: 18 school buildings can be targeted according to the planned budget and the implementing period is to build 5 schools in 2020 to 18 schools in 2030.	a) Energy saving b) Low carbon building c) Strengthen school capacity to accommodate more students	1,950,000	2,000,000	Following last updated Standard Design of MoEYS and Climate Change to implement as pilot project including the components as below: 01 tiling roof school building with 05 classrooms, equipped with furniture for students and teachers, electricity power connection, indoor ventilation, lightning protection equipment, latrine and sanitation room, water well and water tank, planting tree and garden etc...	Increase enrollment rate of girls with more schools closed to home. Target: 47% of all new school enrollments are girls			Provide construction guidelines to companies	4, 5, 9, 13
46	**Implement climate change and disaster resilient construction and infrastructure standards including for public sector and community-focused buildings covering public health, education, WASH etc.**	Infrastructure - Buildings	National Committee for Disaster Management (NCDM)	- 2015 Law on Disaster Management (Article 10, 11) - Climate Change Strategic Plan 2014-2023 (Strategic Objective 4) - National Action Plan for Disaster Risk Reduction 2019-2023 (Priority 11)	- Increased infrastructure resilience to withstand impacts of disasters - Interlinked with energy-efficiency policies for Climate Change Adaptation	Baseline: Standard is in draft now, and further development and implementation are needed - 100% of new building compliant with climate and disaster resilient construction guidelines - Conditional: 20% of older buildings retrofitted - Established guidelines for incorporating climate and disaster risk assessments into design and construction of new buildings and critical infrastructures (school, health facility and other facilities). - Established or improved national legislative frameworks for resilient construction and its implementation mechanism.	- Technical guidelines cross-beneficial to other sectors - Potential for community groups (e.g. school support committees) to be involved in construction/retrofitting - Increased energy-efficiency, and use of climate-aware products	400,000 (needs to be enhanced to account for reconstruction of older buildings)	The standard will benefit to social and economy (28,000K) 1$ investment produce 70$ benefit	- Existing know-how and policies to reduce global buildings sector energy use by 2050. - Key Findings from the Intergovernmental Panel on Climate Change Fifth Assessment Report – Climate Change Implication for Buildings. http://bpie.eu/wp-content/uploads/2015/10/Template_AR5_-_Buildings_v10_-_Web_Pages.pdf	Target: 30% of all new jobs would be taken up by women	Conditional	Youth would be an employee, workers	Private sector would engage in process by learning from standard and apply these gained knowledge to their project	5, 9, 13

47	**(DLUP) Prepare spatial planning (city/district/municipality) guidelines at all levels for climate change adaptation** **(CLUP) Integrating climate change response measures to the commune land use planning**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	National Policy and Strategic Plan for Green Growth 2013-2030 National Urban Development Strategy	Strengthen legal framework and national and sub-national capacity for resilient urban growth	Baseline: 0 CLUP and DLUP with strong vision of climate change measures (Conserve 35% of area for Green Space to buffer urban development from climate hazards): 20 districts: 20% by 2024 60% by 2026 By 80% by 2030, and 100% by 2034 350 communes land use planning (CLUP) have been completed Baseline:20% of communes,2024) 60% by 2026(unconditional) By 80% (conditional) by 2030, and 100% by 2034	Enhance terrestrial, aquatic resources of each ecosystem of the commune and district location to preserve and conserve environmental degradation (35% of total commune land are green spaces) and enhance social stakeholder to participate the during road map design and CLUP/DLUP study	586,000 Of which: 326,000 16,300 per CLUP/DLUP implementation of adaption designing activities in 350 communes and 20 Districts (unconditional) 260,000 US$13,000 per District (conditional)	Benefit from reforestation programme: US$ 6,355,000	Land Survey High Technology Aero Photo for mapping Soil Test for spatial planning	32% (Standard of ADB and world bank) of local and sub national decision makers are women Women make up 50% of those consulted as part of the CLUP processes Restoration can be a crucial opportunity for women's economic empowerment: 32% of restoration jobs go to women in the community		Engage youth in implementation	Private sector: contract consultants to provide technical aspect on planning and full engagement for implementation	5, 13, 14, 15
48	**Integrating climate change response measures to the policy of social land concession (SLC) and its procedures**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	NAP Financing Framework and Implementation Plan: Sector #34, Sector#35, and Sector#16	(1) Builds capacity to effectively respond to food insecurity and reduces the risks related to disasters such as floods and droughts in social land concession areas. (2) Climate-proof Low-cost shelter construction for land recipients.	Baselines: 0By 2023: the sub-decree 19 and other related legal documents of Social Land Concession is fully revised with mainstreaming climate measureBy 2026, at least two to three social land concession areas are fully intervened by climate change measures, especially farming land and residential land are allocated with full climate change concerns and technologyBy 2030: All housings and other associate infrastructures in allocation in SLC are fully climate-proofed. By 2030: 100% of land recipients are well aware of climate change through capacity buildings	The country's land poor and landless families have received land, have improved their livelihoods via land allocation, and land recipients have capacity to challenge with climate change impacts because they have been trained and educated on climate change. On the other hand, allocated land to people to use for their farming creates soil fertility	1860000			Target: 30-50% of stakeholders consulted are womenRestoration can be a crucial opportunity for women's economic empowerment. 32% of restoration jobs go to women in the communityIdentification and selection process of SLC policies and procedure will include women beneficiaries	Conditional	Youth will be targeted in the consultation process of the SLC to endure they are well informed, and their needs are address in the planning and implementation of the SLC	Private sector will be engaged at the implementation stage to market activities (for instance, to buy agriculture products from the communities)	5, 13, 14, 15
49	**Prepare modality of standardized green spaces for urban planning or new sub-cities to address vulnerability of urbanization.**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	National Policy and Strategic Plan for Green Growth 2013-2030	All vulnerable or highly vulnerable communes can be covered. (1) Development of Guidance toolkit for Enhancing climate change vulnerability and adaptation assessment toward zoning in spatial planning; (2) Development of toolkit for Zoning and prioritizing adaptation measures and promote low-carbon land use development and planning	Baseline: 0 By 2023: Green Building Development toolkit is formulated. Green physical space is standardized for commercial purpose and other small city use By 2030: At least 50% of small city development request are permitted with fully use of all elements in toolkit By 2030: All small enlarged city is standardized with full physical and climate resilient norms addressed in tool toolkit.	Mitigation co-benefit: contribution to the local GHG emission Environment co-benefit: ecosystem restoration (i.e. regulate water) Social co-benefit: job creation, improved public health	7860000			Target: 30% of consulted community members are women Restoration can be a crucial opportunity for women's economic empowerment.	Conditional	Needs of youths will be reflected in the urban or sub-city planning process	Private companies such as construction companies, gated communities, architect companies, engineers, etc. will be engaged to ensure climate change issues are reflected in their practices	5, 11, 13

					3) Introduction of toolkits into practical use										
50	**Vulnerability Assessment towards the development of climate change strategic plans to respond to the impacts on land, housings, coastal management, and building due to climate change**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	Climate Change Action Plan of MLMUPC National Urban Development Strategy	Improve knowledge on urban vulnerabilities to climate risks for cities in urban and rural areas Strengthen early warning systems for urban and rural slumps	Baseline: 0 By 2030, 60% of cities in urban and cities assessed on its vulnerabilities (conditional) By 2050, 100% of cities in urban and cities assessed on its vulnerabilities (unconditional)	Contribution to climate data related to cities through finding of the assessments	2560000			Target: 30% of vulnerability assessment (data enumerators and analysis staff) are women # of assessment that include gender and age disaggregated data Restoration can be a crucial opportunity for women's economic empowerment.	Conditional	Youth issues will be included at the assessment design and analysis stages	Climate change impacts on private sector investment and private sector roles in reducing vulnerabilities will be part of the assessment	5, 9, 14, 13
51	**Promote land use planning tools for urban houses and building construction adaptive to climate change benefits to the low-income and homeless people**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	NAP Financing Framework and Implementation Plan: Sector #34, Sector#35, and Sector#16	Improve adaptive capacity of low - income households and vulnerable households through provision of climate-proofed shelters	Baseline: 0 By 2023: Complete zoning and all toolkits, and guidelines By: 2008: Complete 50% of Urban Buildings And 50% of rural housing By 2030: Complete 100% of Urban Buildings and 100% of rural housings	The project will produce low-carbon emissions to enhance environmental atmosphere Social co-benefit: build assets (housing) for low income and homeless people	2560000		Climate-resilient building construction technology and Low-cost affordable housing technology	Target: 30% Restoration can be a crucial opportunity for women's economic empowerment. Ensure socially marginalized and low income/homeless people are consulted in the process of developing guidelines for building/construction 50% of house beneficiaries are low income women	Conditional		The tools will be disseminated to construction sector to encourage them engage them in climate resilient projects	1, 5, 9, 10, 13
52	**Promote proper low-cost shelters for low income households resilient to climate change, practically in the area of social land concession**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	NSDP 2019-2023 and NAP Financing Framework and Implementation Plan: Review of Priority Action, and Construction Law 2019	Improve resilience of ecosystem (through reduction or resource depletion	Baseline: 0 By 2023: Complete zoning and all toolkits, and guidelines By: 2008: Complete 50% of rural housing By 2030: Complete 100% of rural shelters in social land concession	The project will produce low-carbon emission that is to enhance environmental atmosphere Social co-benefit: reduce land conflict, improve livelihood of beneficiaries through provision of low-cost shelters in the areas of social land concession	32560000			Target: 30% Restoration can be a crucial opportunity for women's economic empowerment. 50% of all newly contracted rural shelters are used by women 100% of all rural shelters include separate spaces (rooms with doors and lavatory facilities) for women and children use	Conditional		The tools will be disseminated to construction sector to encourage them engage them in climate resilient projects	1, 5, 10, 13, 15
53	**Development of building code with mainstreaming climate change into building designs**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	National Policy and Strategic Plan for Green Growth 2013-2030	Improve regulations and national capacity on building code to adapt to climate change	Baseline: 0 By 2024: Toolkit finalized, and launching By 2026: 50% of building permits are mainstreamed, By 2030: 100% of building permits are fully mainstreamed By 2026: 1000 engineering professionals trained, and by 2030: 2000 professionals are trained	Energy consumption in building sectors Reduction of GHG in atmosphere Promote low-cost materials for building and housing Improve health and safety of city inhabitants	6560000			Restoration can be a crucial opportunity for women's economic empowerment. Target: 30% of trained professionals and engineers are women	Conditional	Youth issues and roles will be integrated in the development process of the building code	Building code will be enforced amongst private sector practices	5, 9, 13
54	**Mainstream climate change response measures into coastal development planning against sea water intrusion, sea water rise and seasonal storm destruction, and rising temperature**	Infrastructure - Land use planning	Ministry of Land Management, Urban Lanning and Construction (MLMUPC)	National Policy and Strategic Plan for Green Growth 2013-2030 National Urban Development Strategy Cambodia Climate Change Strategic Plan	Build climate resilience of coastal ecosystem	Baseline: 0 By 2024: Complete all associate tools and planning scenarios for building, housing, and coastal protection By 2030: 100 km sea wall completion (conditional)	Promote sea engineering environment, sea water rise, sea tidal hazard, seawater intrusion and sea erosion Disaster management to protect coastal populations	Operation Cost and TA cost: (1) 4,500,000 (2) Sea Wall: 98,000,000 Total: 102,500,000			Restoration can be a crucial opportunity for women's economic empowerment. Target: 30% of all construction jobs go to women 30% of all training and awareness raising participants are women		Youth: socio-economic, geographical, ESIA, Climate Change and other study	Private sector as construction design and implementation	

55	**Strengthening climate resilient city**	Infrastructure - Land use planning	National Committee for Sub-National Democratic Development (NCDD)	NAP-2017: Climate risk management and rehabilitation of small, medium, and large-scale irrigation infrastructureCCCSP 2014-2023: Introduce technologies in water work development and rehabilitation in response to the negative impacts of climate changeCCCSP 2014-2023:Leverage the decentralization process to strengthen financial and institutional processes for local adaptationMainstream climate change into national and sub-national development plans and the NSPS	Strengthening sub-national capacities and processes for localizing and delivering on SDGs and building resilience at the city level, the initiative will seek to address unstainable pattern of urban growth. Climate exacerbated impact is also adding challenges to sustainable growth, the initiative will also consider integrate climate planning in city planning and investment projects. It will tackle the barriers on: 1. knowledge and capacity; 2. access to finance, and 3. partnership engagement.	Baseline: 0Target: 3 municipalities of Siem Reap, Kampong Cham and Tbong Khmum	Strengthen knowledge and capacity on resilient city.Financing for resilient cities.Partnership and communication.	10,000,000	15,000,000	1. Climate change governance2. Climate vulnerability and impact assessment 3. National Green Growth Policy	The component of project output to be aligned with Policy on Promotion of Gender Equality for Sub-national Democratic Development of NCDD				
56	**Develop national road construction and maintenance design standards for national and provincial roads, considering climate change impact including M&E framework develop for climate proofing and low-carbon technology roads**	Infrastructure - Roads	Ministry of Public Works and Transport (MPWT)	Cambodia Climate Change Strategic Plan 2014-2023 NSDP 2019-2023 Rectangular Strategy National Policy on Green Growth 2013-2030 Sectoral Development Plans	The future national transport infrastructure is climate proofed, especially in sensitive/vulnerable area where new standards have been used in design phase of construction projects.	Baseline: 0 - One guidebook on climate proofing roads with design standards will be developed by 2022 - All repair and new road construction will follow the climate proofing design standard by 2030 - M&E framework develop for climate proofing standard road by 2023	Reduce road repair/ rehabilitation cost Reduce vehicle maintenance Save time Ensure flow of traffic and transportation	500,000 (Experts, data collection and analysis, review and risk assessment of climate change impact, …)	600,000 USD. -Climate proofed standard design is built, quality of road infrastructure resilience to extreme climate event reduce maintenance and rehabilitation cost, good condition of road will result in better combustion led to GHG reduction	Guidelines for Climate Proofing Investment in the Transport Sector Road Infrastructure Projects by ADB Guidelines for climate proofing investment in the transport sector: Road infrastructure projects by WB Capacity building program for stakeholders on climate proofing road standard	25% at least of workers or beneficiaries are female The climate proofing road standard will consider gender considerations to ensure the women have full access to roads and use roads as a means to improve their income and livelihood. 30% of local women report increased mobility all year round due to improved roads	Unconditional-for publication (national budget)+Training			5, 9, 13
57	**Repair and rehabilitate existing road infrastructure and ensure effective operation and maintenance systems, considering climate change impact**	Infrastructure - Roads	Ministry of Public Works and Transport (MPWT)	Cambodia Climate Change Strategic Plan 2014-2023, National Adaptation Plan Financing Framework 2017	Strengthen climate road resilience to avoid loss and damage due to climate hazards and ensure full and sustain road operations for road users particularly most vulnerable group	Baseline: 0 New national road construction using climate proofing road standards by 2030. Repair road using climate proofing standards by 2030.	- GHG mitigation using low carbon technology road - Building road with less impacts on forest, biodiversity - Planting tree along road and highway to reduce heat and emission produced by road -Ensure sustainability of water run-off for the intersection of water way and road line	10,000,000 (road construction and maintenance)	11,000,000	Guidelines for Climate Proofing Investment in the Transport Sector Road Infrastructure Projects by ADB Guidelines for climate proofing investment in the transport sector: Road infrastructure projects by WB Capacity building program for stakeholders on climate proofing road standard	25% at least of workers or beneficiaries are female New and repaired roads will ensure access of women particularly those living in the climate hard hit area and enable them to access necessary basic need such as markets, healthcare, water resources. 30% of local women report increased mobility all year round due to improved roads			For new road, this will be under construction companies (Private Sector)	5, 9, 13

58	**Rural road rehabilitation and improvement for climate change resilience**	Infrastructure - Roads	Ministry of Rural Development (MRD)	-Rectangular strategy -NSDP -MRD Strategic Plan	Improve resilient capacity of rural road s	Baseline: 0 DBST 3166 Km Concrete: 812 Km	- Contribute to GHG reduction - Food Security, Agriculture market connectivity, Skill development, Improve productivities	800,000,000	- Better rural connectivity will promote a better rural economic, and environmental activities	The current technology is available for resilient road construction; however, more advanced tech is still needed for construction in a challenging Environment.	Target: 30% of those who receive skills training are women 50% of those benefiting from social and economic facilities are women Men and women have access to social and economic facilities.			All construction companies as are all private	5, 8, 9, 13
59	**News coverage and program production for awareness raising on climate change and its impacts**	Knowledge sharing	Minister of Information (MOINF)	-National Adaptation Plan Financing Framework (2017) Cambodia Climate Change Strategic Plan (2014-2023) -Ministry of Information Strategic Plan	-Producing diversified and pluralistic contents enable to attract the attention of different types of audiences on climate change through educational spot, featuring news, roundtable discussion and entertainments.	Baseline: No baseline available (several climate change topics ,news feature, and roundtable discussion have been produced) Targets: -Produce numbers of educational spots - Numbers of Roundtable discussion session being conducted -Featuring/ Reporting news related to climate change - Produce numbers of songs, and other entertainment. National Radio Cambodia (RNK) plan to produce - 120 topics of news feature related to climate change and 60 Hours of Airing - 120 topics on Climate Change to be discuss at "Suntanea Matik" Talk Show and 240 Hours of Airing - Cover 360 news article on Climate Change and 18 Hours of Airing	-Reduce cost of climate risk -GHG Mitigation Environmental protection -Forest protection -Biodiversity conservation	3000000	- Hundreds of educational materials being produced and documented - Different types of audience being informed on climate change	-TV -Radio -Website -App -Social Media	Women is among the targeted audience in which they feel the sense of inclusivity. Target: 30% of roundtable participants are women	Conditional	Youth is one of the targeted group in which the contents to be produced for.	final production/materials will be published/broadcast at private media organizations	4, 5, 13
60	**Develop and annually update national and subnational multi-hazard and climate risk assessments, including identification of most vulnerable communities.**	Livelihoods, poverty and biodiversity	National Committee for Disaster Management (NCDM)	- 2015 Law on Disaster Management (Article 16)- National Action Plan for Disaster Risk Reduction 2019-2023 (Priority 3, 4)- Climate Change Strategic Plan 2014-2023 (Strategic Objective 5)	- Risk-informed, country-wide hazard assessment to be used as a guidance for development planning- Disaster risk information can be used as evidence to inform local development planning- Centralized database managed by NCDM increases institutional resilience. - Inter-ministerial agreement/s on mechanisms and protocols on climate and disaster data and information sharing among government ministries and agencies. - Vulnerable communities identified, and can become better prepared for future disasters	Baseline: 0Targets: 25 provinces/City based on the identified hazard- CamDI (Cambodia Disaster Database) operational and regularly updated.- One national presentation on CamDI organized every year.- National Risk Assessment/Profile, updating the available risk assessment in Cambodia- Spatial risk analysis / multi-hazard risk assessments an national and sub-national level, incorporating climate change scenarios	- National risk assessment can be used as a basis for priority areas of adaptation and mitigation activities - Enhanced database on disaster occurrences in Cambodia- Being an instrument in monitoring disaster impacts across the country; can be used to informed priority areas and actions on mitigation activities.- Can be used alongside ID Poor system	1,500,000	$2,000,000 (just benefit from CAMDI)	- INFORM Risk Index, www.inform-index.org, an open-source methodology for quantitatively assessing crisis and disaster risk. - Global Disaster Database, EM-DAT http://www.emdat.be/database, which houses country-level information of past disasters (since the early 1900s).- Country-level information also available on compiled platform managed by the ReliefWeb (http://reliefweb.int/countries)- Various / existing climate change scenarios studies developed for Cambodia.- CamDI platform (www.camdi.ncdm.gov.kh) - CamDI user's manual (developed in 2014, updated in 2020).- After adoption of Sendai Framework for Disaster Risk Reduction (SFDRR), the country's data base is to follow DesInventar database.DesInventar software is available for country's adoption, available here: https://www.desinventar.net/	30% of presentation participants femaleGender and age disaggregated data is collected and made available as per the guidance of SFDRR.At least 20% of women in technical positions and decision making roles at national and subnational levels.Gender and disaster vulnerability atlas could be developed.	Conditional	Ao- that is at a technical stage	NCDM will engage the private sector in process. They could support NCDM for funding, material or cooperation	5, 13

61	**National end-to-end early warning systems with focus on effective dissemination to populations at risk**	Livelihoods, poverty and biodiversity	National Committee for Disaster Management (NCDM)	- 2015 Law on Disaster Management (Article 11) - National Action Plan for Disaster Risk Reduction 2019-2023 (Priority 16) - Climate Change Strategic Plan 2014-2023 (Strategic Objective 2, 5)	- Availability of real-time climate data for informed climate information - Enables community-level preparedness and response to disasters	Baseline: only one system naming 1294 (specifically on flood) with covering 25 provinces (baseline-there are some cooperation with NGOs Target: to scale up to all communes/districts - Installation of 100 Automatic Weather Stations and 100 Automatic Hydrological Stations for national coverage. - Introduction of climate smart agriculture / drought resistance agriculture techniques in drought vulnerable provinces, based on the multi hazard risk assessment. - Nation-wide coverage for multi-hazard (flood, drought and storm) early warning - Transboundary flood early warning systems with Vietnam and Thailand established	Other sectors, i.e. water resources and meteorology, agriculture will be of benefited by potential cross-sectoral mitigation activities.	15,000,000	$100,000,000	- Automatic Weather and Hydrological Stations configuration in Cambodia, including Integrated Water Management System and other data bases established. - Realtime technology-based forecasting developed by advanced meteorological societies worldwide, e.g. Meteo France International, Finnish Meteorological Society - EWS1294 technology (http://ews1294.info/en/home/)	Females to make up 40% of subscriptions to EWS1294 system Gender-sensitive EWS to be implemented, including inclusion of disability and other most vulnerable group. Specific EWS medium is to be implemented for various types of disability.	Conditional	Youth could promote and share the system to community people	Private sector would take some roles (subject to discuss more) for example introduction new technology/knowledge (mobile company provide the data)	1, 5, 13
62	**Implement community–based disaster and climate risk management programs**	Livelihoods, poverty and biodiversity	National Committee for Disaster Management (NCDM)	- 2015 Law on Disaster Management (Article 10) - Climate Change Strategic Plan 2014-2023 (Strategic Objective 3) - National Action Plan for Disaster Risk Reduction 2019-2023 (Priority 9)	Strengthened community preparedness and adaptation capacities.	Baseline: 2 (at Kompot and Kep provinces) Target: 75% of communities have preparedness and contingency plans developed and updated bi-annually, including disaster simulation and climate change adaptation strategies	- Social resilience at community level and increased engagement in disaster preparedness and response - Reduced asset, infrastructure, and life loss due to disasters	6,000,000	$42 million 1$ investment produce 70$ benefit	- Community Based Disaster Risk Management Field Practitioners Handbook: https://www.adpc.net/igo/category/ID428/doc/2014-xCSf7I-ADPC-12handbk.pdf - KoBo toolbox for community assessment https://www.kobotoolbox.org/	Females represent 25% of VDMG and CCDM Training of trainers of Women Champion in DRR and CCA – ensuring more representative of women on disaster and climate risk management. 25% increase of women in climate change community based decision making positions	Conditional	Could incorporate youth as community volunteers	Private sector would engage in process by learning from standard and apply these gained knowledge to their project	1, 5, 13
63	**Building resilience of biodiversity conservation and restoration to adapt to climate change**	Livelihoods, poverty and biodiversity	Ministry of Environment (MOE)	National Protected Areas Strategic Management plan 2017-2031		Baseline: 0 15 PAs with species-specific conservation action plans 15 PAs with forest restoration plans under implementation Total budget: 1,250,000+3,750,000=	Environment	1,125,000	To improve the knowledge base, support conservation action, and strengthen the enabling environment for addressing threats to species and ecosystem Number of PAs with species-specific conservation action plans	Promote biodiversity conservation and restoration	25% of eco-tourism inputs/initiatives are directed to women Women make up 50% of representatives in biodiversity conservation inanities (decision making, training, capacity building, services etc.)			Ecotourism Forest restoration	13, 5, 15
64	**Integrated village development**	Livelihoods, poverty and biodiversity	Ministry of Rural Development (MRD)	-Rectangular strategy -NSDP -MRD Strategic Plan	Building adaptive capacity of rural family to be smart in agricultural productivities and other livelihood promotion in changing environment.	Baseline: 10 villages in Takeo, 10 in Kampong Speu and 10 Thbaung Kmom Targets: -	-Job creation -Food security -Behavior Change -Better living environment -Wellbeing and environmental friendliness of communities to improve	200000000		Lessons learnt and best community practices from advanced countries	Target: 30% of total beneficiaries are female Gender-responsiveness towards more participation in decision making and benefits. Women will be empowered in communities and households.	Conditional for 170 villages	Incorporate youth as community volunteers.		1, 2, 5, 13

65	**Strengthen flood resiliency capacity of communities around Tonle Sap (access to clean water, off grid renewable energy, and waste management)**	Livelihoods, poverty and biodiversity	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: a) Leverage the decentralization process to strengthen financial and institutional processes for local adaptation b) Mainstream climate change into national and sub-national development plans and the NSPS	Strengthen climate-resilient local governance through financial, institutional, policy and strategic plan reform in order to respond to current and projected climate hazards and prevent from loss and damage due to hazard	Baseline: 0 Targets: 10 communes of 4 provinces namely Battambang, Pursat, Kampong Chhaning, and Siem Reap Province with integration of climate change into financial management, institutional arrangement and policy reform by 2028	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission though reducing fire wood consumption and waste pollution. b) Strengthen resilient capacity of women and girl in flooding community though accessing to clean water and clean energy. NCDD will also implement ESS, Gender, M&E along with climate action	10,000,000	20,000,000	1. Climate change governance 2. Climate vulnerability and impact assessment for 10 target communes Climate vulnerable map	Target: 30% of women 30% of women report increased access to clean water 30% of women report access to off grid renewable energy technology and inputs a) Promote inclusiveness, gender equality, and accountability by engaging more women in institutional arrangement for climate change b) Cambodia Gender and Climate Change Action Plan c) Policy on gender for sub-national democratic development	Conditional	For waste management	Companies for waste collection, green technology and clean water	2, 5, 7, 12, 13
66	**Building climate resilient livelihood and public infrastructures in social land concession for vulnerable communities**	Livelihoods, poverty and biodiversity	National Committee for Sub-National Democratic Development (NCDD)	Rectangular Strategy Phase IV 2018-2023:The 4 priority areas include Road, Water, Electricity and People to set the agenda for development while priority order of these four priority areas have been changed according to development phase. In the first two Legislatures, the Rectangular Strategy gave the top priority to Road, followed by Water, Electricity and People. In the Rectangular StrategyNSDP 2019-2023: Development of physical infrastructure including:- Development of Transport and Urban Infrastructure- Water Resources and Irrigation System ManagementCCCSP 2014-2023:- Climate change implication on infrastructure- Mainstream climate change into national and sub-national development plans and the NSPS	The Climate resilience at local level, within the social land concession communities will be strengthened and adapted through integrated into the support community infrastructures and sustainable management response to flood, drouth, strong wind. In addition, the GHG also effectively reduces from the introduce of sustainable land management practices by adopt to resilience agriculture activities and forest resources management that will positively create alternatives livelihood for the potential vulnerable communities. Help to build ownership and decision-making process at the community level as resulted from the project, the community will be able to engage in local planning and implementation with regards action to adapt with future trends of climate change.	Baseline:0Targets: 12 communes, 7 districts and 5 provinces across different geographical area of Cambodia including Kampong Thom, Kampong Chhnang, Kampong Spue, Tboung Khmum and Kratie province to receive the resilient infrastructures services, improving their livelihood alternatives and sustainable growth. The project is planning to scale up to other potential areas as nationwide through lesson learnt and key success of its implementation	Modality: the project designed as potential for scaling up through its key success of implementation. It would be the key recommendation for the improvement of social land concession implementation to include climate change as one of main focus while community will really need support to cope with such climate change issues when settle-in new development area of social land concession sites. Improve knowledge: the project will help to improve understanding for sub-national level, local authorities on climate change both of adaptation and mitigation though join implementation follow decentralize approach under coordination of National Committee for Sub-National Democratic Development Secretariat (NCDDS). Similarly, the community groups will also receive training and awareness raising to build their sense understanding climate change to engage fully participation for the project implementation. This will positively contribute to both of adaption and mitigation action in the future.	14,500,000	18,000,000	1- Development of Information and Communication Technology (NSDP 2014-2023)2- Climate change governance3- Climate Change Index4- Social Land Concession sub-degree 5- National REED+ strategy 2017-2026	Adapt with Policy on Promotion of Gender Equality for Sub-national Democratic DevelopmentGender and Climate Change, green growth, and disaster managementCambodia Gender and Climate Change Action PlanThe Project will also contribute to the goals of the RGC's new "Five Year Strategic Plan to Promote Gender Equality and Women's Empowerment 2019-2023", which aims to address women's limited access to assets and services. inclusiveness, gender equality, and accountability by engaging more women (at least 30%) in institutional arrangement and implementation				

67	**Building climate resilience for district and commune governance through policy and strategic development plan reform (focus on implementation)**	Policy and planning	National Committee for Sub-National Democratic Development (NCDD)	CCCSP 2014-2023: a) Leverage the decentralization process to strengthen financial and institutional processes for local adaptation b) Mainstream climate change into national and sub-national development plans and the NSPS	Strengthen climate-resilient local governance through financial, institutional, policy and strategic plan reform in order to respond to current and projected climate hazards and prevent loss and damage due to hazards	Baseline: 0 50 communes of 9 provinces namely Takeo, Battambang, Peahvihear, Krati, Steng treng, Kampong Chhaning, Prey Veng, Svayreng, and Kampot with integration of climate change into financial management, institutional arrangement and policy reform by 2027	a) Improve knowledge of local governance on impact of climate change will lead to mitigate GHG emission b) NCDD will also implement ESS, Gender, M&E along with climate action c) Improve performance-based of sub-national government on climate change planning and accessing to climate resilient grants	10,000,000	15,000,000	1 - Climate change governance 2 - Climate vulnerability and impact assessment for 50 target communes 3 - Climate Change Index	Target: 30% women in local (commune and district) government participate in capacity building and awareness raising on climate impacts a. Promote inclusiveness, gender equality, and accountability by engaging more women in institutional arrangement for climate change b. Cambodia Gender and Climate Change Action Plan c. Policy on gender for sub-national democratic development	Conditional	Engage youth in analysis on impact of climate change and integrate cc into development		5, 13
68	**Mainstreaming climate change into Education Strategic Plan 2019-2023 Strategic Plan and SDG4 Roadmap for Education 2030**	Policy and planning	Ministry of Education, Youth and Sport (MOEYS)	1. SDG4 Roadmap for education 2030 2. ESP 2019-2023 3. CCCSP2014-2023: Capitalize on lessons learned, local knowledge and good practices for development of policies and actions for adaptation and mitigation.	Strengthen resilience through education policy, research and planning reform in order to respond to climate related hazards.	Baseline: Integrated in ESP 2019-2023 primary and secondary sub-sector (Only strategies) Target: climate change concepts are mainstreamed into ESP and SDG4 Roadmap for education 2030	a) Climate change adaptation b) Policy, Planning & Guidelines, c) Strengthening d) Research enhancement	800,000	900,000	1 - SDG4 Roadmap for education 2030 2 - ESP 2019-2023 3 - Strategies and interventions in the ESP and SDG4	Gender participated in the planning process on SDG4 and ESP Target: 47% by 2023				4, 5, 13
69	**Strengthen the cooperation with local and International development agencies, NGOs and relevant institutions for technical and financial support to implement the adaptation planning in media sector**	Policy and planning	Minister of Information (MOINF)	-Ministry of Information Strategic Plan	Strengthen the cooperation with local and international development agencies, NGOs and relevant institutions is the best approach to accelerate the strategic plan implementation and ensuring the sustainability of projects.	Baseline: No baseline available. The latest cooperation. Moinfo implemented a project on Climate Change knowledge and Capacity building through TV/ Radio and Media, supported by NCSD / CCCA (2017-2019) Target: MoInfo will seek and work with relevant stakeholders agencies including government and non-government institutions and accelerate the strategic plan implementation	-GHG Mitigation Environmental protection -Forest protection -Biodiversity conservation	100000	Strengthen bond of cooperation between Ministry of Information and stakeholders. The latest cooperation. Moinfo implemented a project on Climate Change knowledge and Capacity building through TV/ Radio and Media, supported by NCSD / CCCA (2017-2019)	-TV -Radio -Website -App -Social Media	Target: 30% are female	Conditional		Collaboration with private media organizations	5, 13
70	**Development of climate change national/capital/ provincial development plans including an M&E system with specific indicators**	Policy and planning	Ministry of Planning (MOP)	NSDP, RS IV, CCCSP, CSDGs	Building climate resilience development planning in the formulation and reporting of the implementation of the development plans and public investment programs at national and sub-national level Building transparent and credible information reporting the progress of the indicators, including CC indicators set in NSDP and CSDGs	Baselines: 0 Formulation of the National/ Capital/ Provincial Development Plan to include climate change strategies/ policies and action plans by 2030 Reporting the progress of the achieving of the set indicators, including climate change indicators in the NSDP and the Cambodia Sustainable Development Goals (CSDGs) 2016-2030 and the achievement and status of the integration of climate change into the sub-	Climate change adaptation and mitigation and other environmental issues (air pollution, water pollution, waste management, biodiversity, etc.) will be integrated into a single plan.	5,000,000 Cost of trainings, consultations, and follow-up activities -Sub-national planning capacity building under budget of government.	6,000,000 Integrated development plan	National M&E Manual/Guideline/Handbook - M&E Capacity Building Plan - Training on M&E incl. data collection methods as well as data interpretation and presentation - Annual Progress Report/Voluntary National Review of the implementation of NSDP/CSDGs"	All gender actions and strategies to respond to climate change are also integrated into development planning and National M&E Guideline and System. Gender target %-NSDP (only for action plan). Only priority is mentioned in development plans Training on gender and age disaggregated data collection will prioritized	Climate change mainstreaming is conditional (Both financial and technical capacity for ToT)			5, 13

					as well as sector development plans	national development plans All indicators reported with credible and reliable resource of information by 2030 The National M&E Manual/Guideline/Handbook formulated and disseminated for official use A long-term M&E capacity building program developed by 2030 At least 10 M&E trainings courses organized Target: 25 provinces									
71	**Development of a climate change public investment program for the national/capital/ provincial levels**	Policy and planning	Ministry of Planning (MOP)	NSDP,RS IV,CCCSP,CSDGs	Building climate resilience investment planning through the formulation and compilation of information of climate investment fund to assist in making decision for climate change actions and priority.	Baselines: 0The National/ Capital/ Provincial three-year rolling Public Investment Program, including the Climate Change-related Projects will be developed every year.Online climate investment and funding information will be available to public by 2030 which include the trend of climate expenditure and potential funding information which will be updated every year.	Mitigation investment planPublic awareness on climate investment and fund will be improved	3,000,000	3,500,000Integrated Public Investment Program	Climate-Informed Decisions: The National/ Capital/ Provincial Public Investment Program including the Climate Change-related Projects as a Mechanism for Lowering Carbon Emissions	Gender involvement is highly considered in the project implementation as stated in the project information sheet/ document.Gender target/%-at 5% of total project staff. Encourage participation of women-% of gender will be specified in the project document which will be determined by partners	Conditional including detail technology		(Private and financial sector)PIP online. Ministries to record all investment plans including climate change in investment. (no training yet and information to be available online for climate investment	5, 13
72	**Building adaptive and resilient capacity for MRD officers at national and sub-national level for mainstreaming climate change into rural development planning processes and technical design.**	Policy and planning	Ministry of Rural Development (MRD)	-Rectangular Strategy -NSDP -MRD Strategic Plan	-Strengthen capacity for Climate Change in rural development planning & technical design.	Baseline: Number of trainings have been conducted by MRD and others but there is no proper system to record Target: By 2030, about 30% of Technical Officials in MRD and PDRD have been trained	- Contribute to the improvement of rural development work in challenging environment	10,000,000	Knowledgeable VDC will help their community better in term of development and challenging environment	- Lesson learnt and best practice from other countries can be applied.	Target: 30% of MRD female staffs will receive capacity building 75% of capacity building recipients report increased knowledge and application of gender integration in their work Gender is considering in all stages of project or programme to promote gender mainstreaming. Gender participation indicator will be included.	Conditional			5, 13
73	**Build adaptive capacity on climate change for village leaders (Village Development Committees, VDCs)**	Policy and planning	Ministry of Rural Development (MRD)	-Rectangular strategy -NSDP -MRD Strategic Plan	Strengthen capacity on climate resilience.	Baseline: 0 Target: 200 VDCs have been trained (1000 VDC members)	- Contribute to rural community development planning and practices in challenging environment	10,000,000		Lessons learnt and best practice from other countries can be applied.	Target: 40% of VDC members in committee are female Gender is considering in all stages of project or programme to promote gender mainstreaming. Gender participation indicator will be included.	Conditional			5, 13
74	**Strengthen resilience and adaptation capacity to climate change in the most vulnerable provinces/districts/communes (produce vulnerability index maps at the commune level, integrate climate change into investment and development plans, demonstrate the identified actions at pilot sites)**	Policy and planning	National Council for Sustainable Development (NCSD)	Cambodian Development Goals Framework (2016-2030)	Infrastructure: road, water, Policies and planning Agriculture Ecosystem-based services	The vulnerability in the provinces around Tonle sap lake and Svay Rieng reduced (90 communes) -Baseline: 2019 vulnerability index		10,000,000	20,000,000		30-60% of beneficiaries	Conditional	Plays an important role in capacity building activities, implementation of the pilot projects and as beneficiaries	Can provide funding, services and technology	5, 13

75	**Update and implement the Cambodia Climate Change Strategic Plan (CCCSP) for 2024-2033**	Policy and planning	National Council for Sustainable Development (NCSD)			The CCCSP for 2024-2033 developed and the implementation successfully conducted until 2030.		5,000,000				Conditional			5, 13
76	**Integrate climate change measures into national policies, strategies and sectoral strategies and plans**	Policy and planning	National Council for Sustainable Development (NCSD)	Cambodian Development Goals Framework (2016-2030)		Enhanced transparency framework set in place and the sectoral M&E strengthened through capacity building		5,000,000				Conditional			5, 13
77	**Enhance institutional capacity on climate change (mitigation, adaptation, policy, strategies, planning, and finance) through awareness raising, training, and advocacy**	Policy and planning	National Council for Sustainable Development (NCSD)	Cambodian Development Goals Framework (2016-2030)		Enhanced capacity of/ and coordination regarding climate change related issues with line ministries and institutions both at the national and sub-national levels. Baseline: KAP3: 2020		2,000,000				Conditional			5, 13
78	**Provide capacity building and supports for Climate Change Innovation at the provincial along Tonle Sap River**	Tourism	Ministry of Tourism (MOT)	-Royal Government of Cambodia labels tourism sector as "Green Gold". -Tourism is a non-smoke industry, which import in places. Ministry of Tourism (MOT) has developed its Climate Change Action Plan for Tourism Sector 2019-2023	-Promoting livelihood resilience through CBT/CBE tourism development. -Improving tourism standards to improve the quality of services and products. -Innovating new products design and efficiency natural resources management	Baseline: 0 1. Strengthen the capacity building on Environmental Education Development (EED) in tourism to stakeholders among 6 Provinces. 6 provinces are just based on first priority strategy plan of MoT where are higher tourist area. Those are Kg Thom, Battambang, Siem Reap, Kg Cham, Kg Chhnang and Pursat. 2. Providing supports for Kampong Thom, Siem Reap, Koh Kong Provinces	Encouraging all involvement tourism stakeholders for better the understanding and to engage their contribution on adaptation to two beneficiaries: 1) Environmental Education Development on green tourism. 2) Peam Krosoap was estimated be upgrade and innovated for climate change adaptation. Cambodia CBET/CET standard. 3) The quality of ecotourism services and products would improve through by tourism innovation. 4) Reducing poverty and contribute to responding effectively to climate change, so it is increasing the gross domestic product of Cambodia (GDP).	2,000,000 - 2,500,000		Public toilet, education signboard, billboard, rubbish bin etc. The M&E system will be aligned with National Monitoring and Evaluation Framework for Climate Change.	Target: 70% of training participants are female Encouraging women, elderly, children, poorest to involve, they might understand and support new mindset that would provide (for adaptation projects).		Youth inside of target communities will be engaged through campaign activities	Cambodia Authority of Travel Agencies (CATA) where consist of dozens agencies-mostly are private sector would provide technical support, strategy development and cooperation	5, 12, 13
79	**Raising public awareness on climate change innovation at all levels**	Tourism	Ministry of Tourism (MOT)	-Royal Government of Cambodia labels tourism sector as "Green Gold". -Tourism is a non-smoke industry, which import in places. Ministry of Tourism (MOT) has developed its Climate Change Action Plan for Tourism Sector 2019-2023	-Promoting livelihood resilience through CBT/CBE tourism development. -Improving tourism standards to improve the quality of services and products. -Innovating new products design and efficiency natural resources management						Target: 60% of women (including children) respond to having an increased awareness of community based tourism and the impacts of climate change on this sector		Youth plays an important role in all activities of MoT such as camping, cycling campaign.	MoT build this awareness through tourist agencies/travel agencies	5, 13

80	**Practicing smart agriculture in tourism sector**	Tourism	Ministry of Tourism (MOT)	-Royal Government of Cambodia labels tourism sector as "Green Gold". -Tourism is a non-smoke industry, which import in places.Ministry of Tourism (MOT) has developed its Climate Change Action Plan for Tourism Sector 2019-2023	-Promoting livelihood resilience through CBT/CBE tourism development.-Improving tourism standards to improve the quality of services and products.-Innovating new products design and efficiency natural resources management	MoT will work closely to expert ministries to enhance the climate resilience farming at local community. This activity is attractive much to tourist. one village one product strategy Baseline: 6 locations Target: 30 locations/provinces					Target: 40% of training participants are women (including children)40% of beneficiaries for new ecotourism product development are women		Youth Engagement: Promotion on quality of organic foods/vegetable to extend using and support on local products.	Support to the local agriculture product, enhance Agric-ecotourism in community by bring tourists to visit and involve agriculture active and create wonderful memories and fun. Pushing on Smart-agriculture plantation and extend on the more create of cycle systems including; fish, meat, vegetable, so on.	2, 5, 12, 13
81	**Establish an automated nation-wide hydromet monitoring network and data transmission program, including collection of climate and hydrological data**	Water resources	Ministry of Water Resources and Meteorology (MOWRAM)	Climate Change Strategic Plan 2014 - 2023 (Strategic Objective 1) National Water Resources Management and Sustainable Irrigation Road Map and Investment Program 2019 – 2033	Enables better preparedness and response to environmental shocks Enables inter-ministerial agreement/s on mechanisms and protocols on climate and disaster data and information sharing among government ministries and agencies Can be used to develop climate-informed risk assessments and strategies Increased national meteorological and hydrological data	Baseline: 80 auto hydromet system already installed. Targets (by 2030): a) 90+ automated hydrological stations b) 51 automated weather stations 94 automated water quality stations c) 410 automated ground water stations d) Coverage: at least 40 % of the country with priority areas e) 26 PDWRAM offices By: 2050 Coverage: 100 % of the country (Conditional)	Data can be used cross-sectorally and for short and long term projection Supporting disaster risk reduction, and other mitigation activities Supporting River Basin management planning and monitoring activities Supporting hydrological modelling works and decision support system (DSS)	47,900,000	The benefit of this activity is contributed to other adaption activities (e.g. #2, #3 and #4)	Automatic Weather and Hydrological Stations configuration in Cambodia Real time hydro-meteorological platform incorporating data from MoWRAM's hydro and meteo station World Meteorological Organization (WMO) guidelines on Integrated Urban, Hydrometeorological, Climate and Environmental Guidelines.	Target: 5-10% females to be involved in network and monitoring plan development.	Conditional	20 students sent abroad for higher education (Master) (Unconditional)	Consulting firm installed system and technical training to operate the system (service provider)	5, 6, 13

82	**Establish a centralized and standardized approach to climate-resilient water management**	Water resources	Ministry of Water Resources and Meteorology (MOWRAM)	Climate Change Strategic Plan 2014 - 2023 (Strategic Objective 1) National Water Resources Management and Sustainable Irrigation Road Map and Investment Program 2019 – 2033	Increased environmental resilience More equitable water distribution/access to vulnerable groups Sustainable development and framework for disaster risk reduction, and can therefore act as a mechanism of coherence among these global frameworks	Baseline: 0 By: 2030 - 10 River Basins have updated River Basin Management Plans - 1 Water Resource and Storage Assessment for River Basin Group completed, for 3+ River Basin Groups/25 River Basins - 1 National Water Resource Management Information Centre established, with facilities to store, analyze and report on water resources data and information, and inform management decisions, and established process for data sharing. - Development of modern and modular fit-for-purpose Decision Support Systems (database, water modelling packages, user interfaces) incorporating remote sensing and observed field data, economic and social information that covers at least 25 River Basins - 20+ of PDWRAM staff, FWUCs, and young-to-middle level Cambodian water professionals receive quarterly training in water resource management - 252 of communities educated on climate and water resource management - Establishment of 252 knowledge hubs to build local understanding of water resources (water and soil), scheme condition and performance, changes in agricultural inputs and outputs etc. - 1 National Water Analytic System covering 32 river basins	Improved relationships between all major water users Improved water allocation and abstraction limits -> reverse/halt overdevelopment impacts Protection of environmental flows as the support of basin human needs and ecosystem	49,600,000	Benefits: The benefit can be estimated from the damage and recovery cost by flood and drought or other water related disaster as below. The potential benefits include: - Flood damage and loss cost: 356 million USD (based on 2013 flood) -Post flood recovery cost 306.28 million USD (based on 2013 flood)		Target: 10-20% female 40% of education project beneficiaries are women Gender and age disaggregated data is collected and used at the water resource management info center		Send around 20 students abroad for higher education (Master)-Conditional	Construction of center and technical support on capacity building	5, 6, 13

83	**Establish a national climate and food warning system, including a service center and flood emergency response plans**	Water resources	Ministry of Water Resources and Meteorology (MOWRAM)	2015 Law on Disaster Management (Article 10, 11) Climate Change Strategic Plan 2014 - 2023 (Strategic Objective 4) National Action Plan for Disaster Risk Reduction 2019 - 2023 (Priority 11) National Water Resources Management and Sustainable Irrigation Road Map and Investment Program 2019 – 2033	Communities (including vulnerable ones) more resilient to disasters Increased risk knowledge More accurately monitoring and predicting risk Dissemination of information to public Responsive to warnings and disasters	Baselines: 0 By 2030: 1 National Centre Established with Decision Supporting System 100% of provinces have Flood Emergency Response Plans	Other sectors, i.e. agriculture will benefit by potential cross-sectoral mitigation activities Flood risk reduction and mitigation	8,800,000	Benefits: can be estimated from the damage and recovery cost by flood and drought the same as #2	Real-time technology-based forecasting developed by advanced meteorological societies worldwide, EWS1294 technology (http://ews1294.info) Existing community based DRR and CCA guidelines	Target: 50% of all stakeholders in consultations on flood warning systems are women Females to be involved in emergency response plan development, and gender mainstreamed throughout. 30% of women in instutional arrangements for climate and flood warning systems		20 students sent abroad for higher education (Master)	Construction of center and technical support on capacity building	5, 6, 13
84	**Integrated groundwater management in Cambodia**	Water resources	National Committee for Sub-National Democratic Development (NCDD)	NAP-2017: Climate risk management and rehabilitation of small, medium, and large-scale irrigation infrastructure CCCSP 2014-2023: Introduce technologies in water work development and rehabilitation in response to the negative impacts of climate change	Strengthen resilience of most vulnerable groups to respond to water shortage issues through sustainable management of ground water	Baseline: 0 90 communes of 9 provinces namely Peahvihear, Banteymeanchey, Oudormeanchey,Kratie , Steng treng, Pursat, Battambang, Siem Reap, and Kampong Thom with integration of climate change into financial management, institutional arrangement and policy reform by 2030	1. Sustainable water management 2. Reduce water pollution 3. NCDD will also implement ESS, Gender, M&E along with climate actions according to GCF standards	10,000,000	15,000,000	1. Groundwater Analysis, Vulnerability and Risk Assessment 2. Groundwater monitoring system 3. Capacity building and advocacy program for ground water	The component of project output to be aligned with Policy on Promotion of Gender Equality for Sub-national Democratic Development of NCDD 50% of stakeholders consulted are women, and people from socially marginalised groups (people with disabilities, the elderly, ethnic minorities)		Youth engagement on groundwater conservation campaign and involvement on water conservation advocacy.	Private sector engagement on groundwater management through exchange of technology adoption.	5, 6, 13

85	**Establish nationally standardized best-practice systems for irrigation**	Water resources	Ministry of Water Resources and Meteorology (MOWRAM)	Climate Change Strategic Plan 2014 - 2023 (Strategic Objective 1)National Water Resources Management and Sustainable Irrigation Road Map and Investment Program 2019 – 2033Strategic Framework for irrigation sector	Improved drought resilienceClimate resilience irrigation systems and sustainable agriculture production	Baselines: 0By 2030: - 10+ regional exchange to countries that have globally recognized specialized irrigation and water resources experience- 1 nation-wide (35 river basins) soil assessment program for irrigation investment established- 1 national standard for design, construction and performance monitoring of irrigation schemes developed- Establish 502 long-term O&M contracts for large irrigation schemes to set-up organizational, management, operational, financial and administration systems, including building PDWRAM and Farmer Water User Committee capabilities- Establish 10+ small pilot trials (50 ha to 100 ha) to test cutting edge technology and advance irrigation practice, including testing water delivery systems, preparation measures, crop types and patterns, fertilizers, and potential scale up cost and benefits- Establish 544 Farmer Water User Committees6 large water storage infrastructures500+ rehabilitated and new irrigation schemes with O&M plans	Improved relationships between all major water usersIncreased productivity of agricultural sectorImproved water allocation and abstraction limits and reverse/halt overdevelopment impactsProtection of environmental flows as the support of basin human needs and ecosystemIncreased drought management	2,498,900	Benefits: Net return from irrigation scheme is estimated 6028 million USD per year in term of paddy rice production of the whole country with 95% of the irrigation service fee (ISF)Net return from irrigation scheme is estimated to be 3904 million USD per year for case of paddy and vegetation combined production	Regulation & water law (river basin planning, IWRM etc.)Existing Irrigation design concept and management methodologyFarmer Water User Communities (FWUC) sub- degree and the FWUC Development Policy and Guidelines of MoWRAMMoWRAM's O&M plan and guideline for irrigation schemes Existing irrigation technologies (e.g., Drip irrigation, Precision mobile drip irrigation, Center pivot irrigation, Fertigation and Chemigation technology)Food and Agriculture Organization (FAO) guidelines on Transfer of irrigation management services	25% of participants for regional exchange are female40% of Farmer Water User Committees female		20 students sent abroad for higher education (Master) (Conditional)	FWUC provide capacity building on technology+NGOsSoil assessment (consulting firm)Standard for irrigation: participation in design standardcutting edge technology and advance irrigation practice: construction	2, 5, 6, 13
86	**Resilient and adaptive rural water supply and sanitation construction**	Water resources	Ministry of Rural Development (MRD)	-Cambodia Sustainable Development Goals -Rectangular strategy -NSDP -MRD Strategic Plan	WASH infrastructure in the rural area resilient and adapted to CC.	Baselines: 0 Water Supply 58% Sanitation 71%	Changing attitude and practices of rural people to be more environmentally friendly	350,000,000		The current technology is available for resilient and adaptive water supply and sanitation	Target: 50% of project beneficiaries are women 50% of stakeholders in consultations are women 50% of training participants on new technologies and adaptive water systems are women Gender will be engaged in planning and using and maintaining water supply infrastructure .		Incorporate youth as community volunteers, Water user group for maintenance of the equipment	All private companies as suppliers	5, 6, 13

Appendix 3: Selected Bibliography

- Bündnis Entwicklung Hilft (2019). *World Risk Index*, Bündnis Entwicklung Hilft publisher
- CDKN (2016). *Planning for NDC implementation: a Quick Start Guide,* Climate Development Knowledge Network
- Davies, G.I., McIver, L., Kim, Y., Hashizume, M., Iddings, S. and Chan, V., (2015). *Water-borne diseases and extreme weather events in Cambodia: Review of impacts and implications of climate change,* International journal of environmental research and public health, 12(1), pp.191-213. https://www.mdpi.com/1660-4601/12/1/191
- Eckstein, D et al. (2019). *Global Climate Risk Index 2020*, Germanwatch
- GSSD (2017). *National Adaptation Plan Financing Framework and Implementation Plan. General Secretariat of National Council for Sustainable Development/Ministry of Environment,* Kingdom of Cambodia, Phnom Penh.
- NCSD (2015). *Second National Communication,* National Council for Sustainable Development/Ministry of Environment, Kingdom of Cambodia, Phnom Penh.
- NCSD (2016). *Promoting private sector contribution to the climate change response in Cambodia,* National Council for Sustainable Development/Ministry of Environment, Kingdom of Cambodia, Phnom Penh.
- NCSD (2018). *Addressing climate change impacts on economic growth in Cambodia,* National Council for Sustainable Development/Ministry of Environment, Kingdom of Cambodia, Phnom Penh.
- NCSD (2020). *Cambodia's First Biennial Update Report (BUR),* National Council for Sustainable Development/Ministry of Environment, Kingdom of Cambodia, Phnom Penh.

Appendix 4: Emission reduction estimates

No	Mitigation Projects/Activities	Lead Ministry	ER ($ktCO_2e$)[28]
1	Promote sustainable energy practices in manufacturing *Garments: 2,291 $GgCO_2e$, 55% by 2030* *Bricks: 1,799 $GgCO_2e$, 44% by 2030* *Food and Beverage: 1,043 $GgCO_2e$, 25% by 2030*	MISTI	5133
2	Urban Planning Tools for Climate Change Mitigation and the urban planning solution in three sub cities	MLMUPC	2.36
3	Application of electrical equipment's labelling & MEPS (Lighting, Cooling & Equipment) *Reduce 1.2 TWh (29.7%) of electricity use in 2030*	MME	1000
4	Improvement of process performance of EE by establishment of energy management in buildings/industries *Voluntary scheme for other companies, especially for SMEs to reduce 10% in 2030*	MME	100
5	Public awareness campaigns, DTEBP-EE info centres *Reduce 2% of energy consumption in 2030*	MME	25
6	Building codes and enforcement/certification for new buildings and those undergoing major renovation *Reduce 10% of electricity consumption in 2030*	MME	N/a[29]
7	Introduction of efficient electrical motors and boilers *Reduce 2.3% of current electricity consumption in 2030*	MME	80
8	Improve sustainability of charcoal production through enforcement of regulations	MME	200
9	Roadmap study on Integration of RE (Renewable Energy) resources. *25 % of renewable energy in the energy mix (solar, wind, hydro, biomass) by 2030*	MME	N/a
10	New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill *Increase the share of waste disposed at sanitary landfills with LFG extraction from 0% in 2020 to 50% by 2030 and extract LFG from the Dangkor Landfill*	MoE	1272
11	Composting of biodegradable organic fraction of MSW supplemented with separation of organic waste (at source). *If 10% of all MSW generated is composted by 2030 then up to 500 $ktCO_2e$/year of GHG emissions can be avoided by 2030*	MoE	500

[28] These emission reduction values were submitted by the lead ministry

[29] N/a: sectoral projections were used.

No	Mitigation Projects/Activities	Lead Ministry	ER ($ktCO_2e$)[28]
12	Production of Refuse-Derived Fuel (RDF) from either a) fresh MSW or b) old MSW mined from the Dangkor landfill. *GHG ER from RDF + anaerobic digestion up to 200 $ktCO_2e$/year*	MoE	200
13	Implementation of National 3R strategy	MoE	421
14	Enhance maintenance and inspection of vehicle (Piloting maintenance and emission inspections of vehicles) *30 vehicle inspection centres in operation by 2030*	MPWT	N/a[30]
15	Promote integrated public transport systems in main cities	MPWT	N/a
16	Reducing GHG emission though off grid street lightening of rural municipality *10 Sangkat of Senmonorom municipality, Kep municipality, and Preah municipality integration of climate change into financial management, institutional arrangement and policy reform by 2028.*	NCDD	N/a
17	Bio-digesters construction (85% reduction compared to 2000) (Small size (2-3-4m3)	MAFF	121.8
18	Bio-digesters construction (85% reduction compared to 2000) Medium size(6-8-10m^3)	MAFF	10.08
19	Bio-digesters construction (85% reduction compared to 2000) Large size(>10m3)	MAFF	8.96
20	Centralized recycling facility for industrial waste from the garment sector *Reduce 108,472 tCO_2e/at an average of 10,847 tCO_2e/year*	MISTI	10.847
21	Climate-friendly cooling of public sector buildings *Reduce 43 000ton/year*	NCSD	43
22	Toward Battambang city to green city *5 Sangkat of Battembang municipality integration of green city by 2025*	NCDD	N/a
23	Shift long distance freight movement from trucks to train	MPWT	N/a
24	Emission management from factories *Monitor air quality at 105 factories annually and provide permit letter on air emission to 90 factories.* *90% of factories to be licensed.*	MoE	N/a
25	Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)	MAFF	N/a
26	Organic input agriculture and bio-slurry; and deep placement fertilizer technology	MAFF	N/a[31]

[30] N/a: sectoral projections were used.
[31] N/a: sectoral projections were used.

No	Mitigation Projects/Activities	Lead Ministry	ER ($ktCO_2e$)[28]
	10 Provinces by 2030		
27	Promote manure Management through compost making process to reduce carbon emission *25 provinces and cities by 2030*	MAFF	N/a
29	Better management of industrial wastewater in the food & beverage sector	MISTI	N/a
30	Implementation of National Cooling Action Plan	MLMUCP	1090
31	Inclusion of performance requirements of Passive Cooling Systems in Building Energy Code of Cambodia	MLMUCP	140.9
32	Implementation of "passive cooling" measures in the cities (addressing urban heat island effect [UHIE]), public buildings and commercial buildings.	MLMUCP	74.5

No	FOLU sector targets	Lead Ministry	ER ($ktCO_2e$)
1	FOLU NDC Scenario 1: 60% forest cover by 2030	MAFF, Rectangular Strategy IV, INDC	302.8
2	FOLU NDC Scenario 2: Reduce 50% of historical emission by 2030	REDD+ Technical Secretariat (RTS)	38.1
3	FOLU NDC Scenario 3: INDC emission reduction (4.7 tCO_2e/ha/year)	INDC	3.8

Appendix 5: NDC Scenarios

In all sectors except FOLU, there is only one NDC scenario. The FOLU sector has three NDC scenarios, as follows:

- FOLU NDC Scenario 1: 60% forest cover by 2030 – (MAFF, Rectangular Strategy IV). Increment of forest cover up to 60% of national land area was suggested by the MAFF. According to the received information, this target is agreed with the "Rectangular Strategy IV, angle 2 (60% of forest cover is maintained)".
- The FOLU NDC Scenario 2: Reduction 50% of historical emission by 2030 (REDD+ programme); This target is based on the REDD+ national strategy which was included due to the suggestions of REDD+ Technical Secretariat (RTS) and the Department of Climate Change. The main assumption of the calculation was to reduce historical emissions from the forest sector by half (76.3 million tCO2e) by 2030 (38.1 million tCO2e), with an average annual reduction of 21 million tCO2e/year.
- The FOLU NDC Scenario 3: INDC emission reduction (INDC, 2015) - (4.7 tCO2e/ha/year).

  This scenario was based on the FOLU sector target presented in the country's INDC report. The INDC target was also developed in the expectation of maintaining 60% forest cover of the total land area. However, the considered base year was 2010. The effort necessary to increase the forest cover was less (from 57% forest cover in 2010 to 60% in 2030. The increment is 3%). Therefore, emission reduction for the increasing 1 hectare of forest cover was estimated as 4.7 tCO2e/ha/year in INDC.

  However, actual forest cover is around 42% in 2020. The 18% of forest cover increment should be applied to achieve 60% target in 2030. Here It was observed how much emission reduction can be achieved using the same emission factor value (4.7 tCO2e/ha/year) in the current circumstances.

The following three overall NDC scenarios were developed based on the three NDC scenarios of the FOLU sector:

- NDC Scenario 1: FOLU NDC scenario 1 combined with available NDC scenarios of other sectors
- NDC Scenario 2: FOLU NDC scenario 2 combined with available NDC scenarios of other sectors
- NDC Scenario 3: FOLU NDC scenario 3 combined with available NDC scenarios of other sectors

Estimated emission reductions under the different NDC scenarios are shown in Figure 15 below.

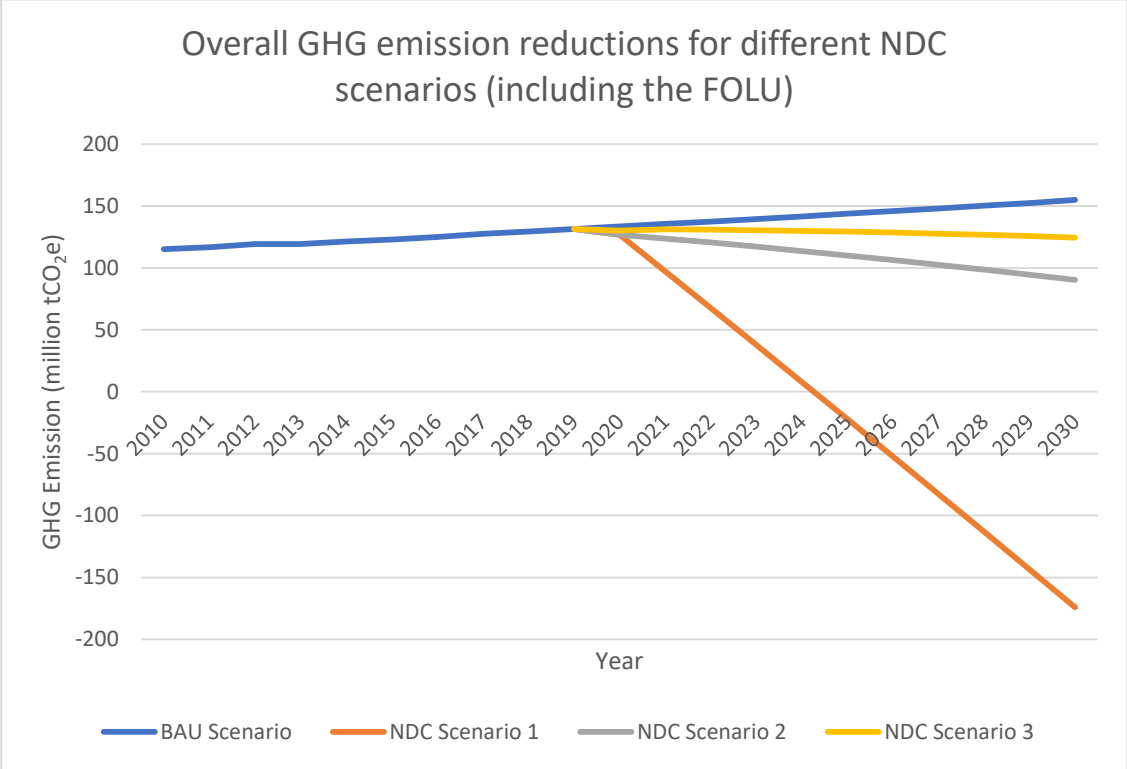


Figure 15 Overall GHG emission reduction (including the FOLU)

Source: NCSD (2020)

As per Figure 15, the estimated emission reduction with FOLU by 2030 under different NDC scenarios will be approximately:

- NDC scenario 1: 329.2 million tCO_2e/year (212.4 % reduction, of which 92% is from FOLU),
- NDC scenario 2: 64.6 million tCO_2e/year (41.7% reduction, of which 59.1% is from FOLU); and
- NDC scenario 3: 30.2 million tCO_2e/year (19.7 % reduction, of which 12.5% is from FOLU).

NDC Scenario 1 - Contribution by different sectors

The share of distribution of the planned emission reduction under the NDC scenario 1 among the sectors is indicated in Figure 16 below.

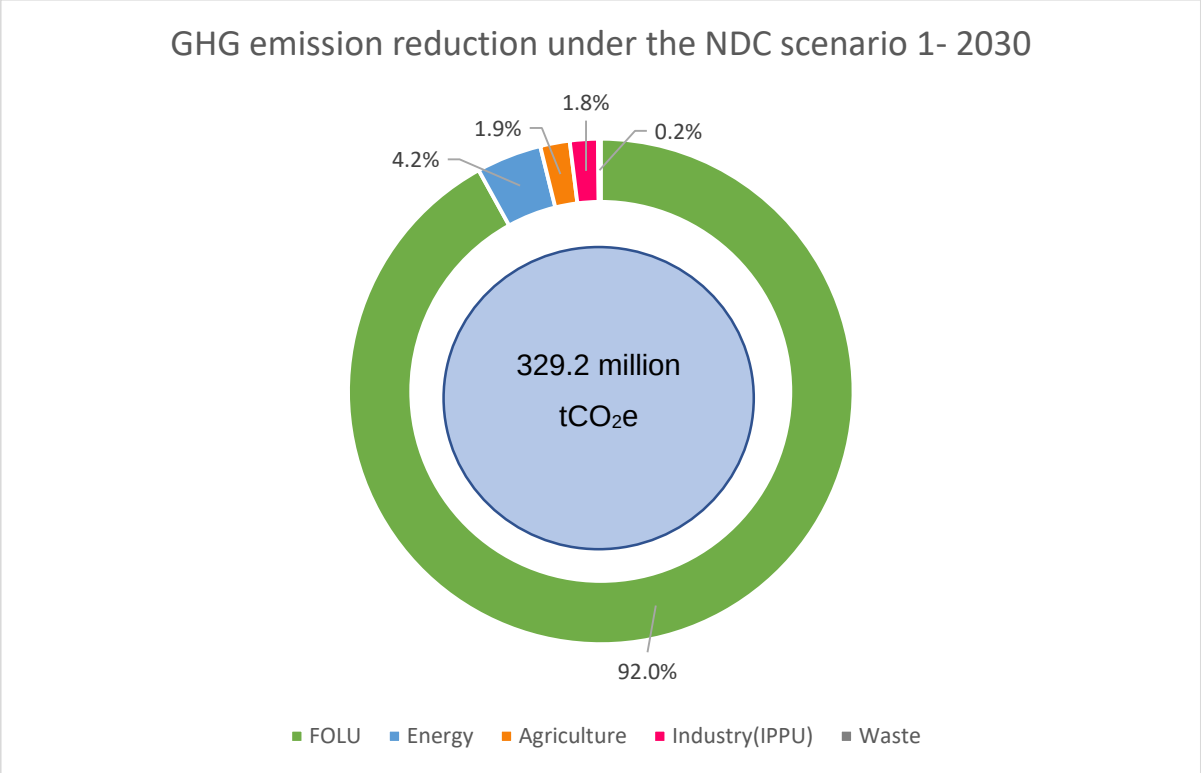


Figure 16 GHG emission reduction under the NDC scenario 1 in 2030

Source: NCSD (2020)

Table 18: Sectoral share and absolute number of GHG emissions reduction under the NDC scenario 1 in 2030

Sector	**Sectoral share (%)**	**GHG emission reduction ($MtCO_2e$)**
FOLU	92.0	302.8
Energy	4.2	13.7
Agriculture	1.9	6.2
Industry (IPPU)	1.8	5.9
Waste	0.2	0.6
Total	**100%**	**329.2**

The NDC Scenario 1 has a mitigation target of 329.2 million tCO_2e/year by the year 2030. This is a 212.4 % reduction compared to the BAU scenario.

The FOLU is to provide the major share of 92% emission reduction by 2030. Other sectors like energy (4.2 %), agriculture (1.9%), industry (IPPU) (1.8 %), and waste (0.2 %) are also expected to contribute in a minor way.

The FOLU sector would contribute to 49.2% of the total GHG emissions of the country by 2030 and 61% by 2016.

However, this is a high national ambition. A main reason for the reduction of forest area is utilizing forest land for agriculture. Therefore, supporting policies such as increasing the yield of agricultural lands and possible interventions like forest gardens where a combination of large and small useful trees are planted in home gardens need to be explored in order to achieve this target without hindering the production of the agriculture sector.

NDC Scenario 2 - Contribution by different sectors

The share of distribution of the planned emission reductions under the NDC scenario 2 among different sectors is indicated in Figure 17 below.

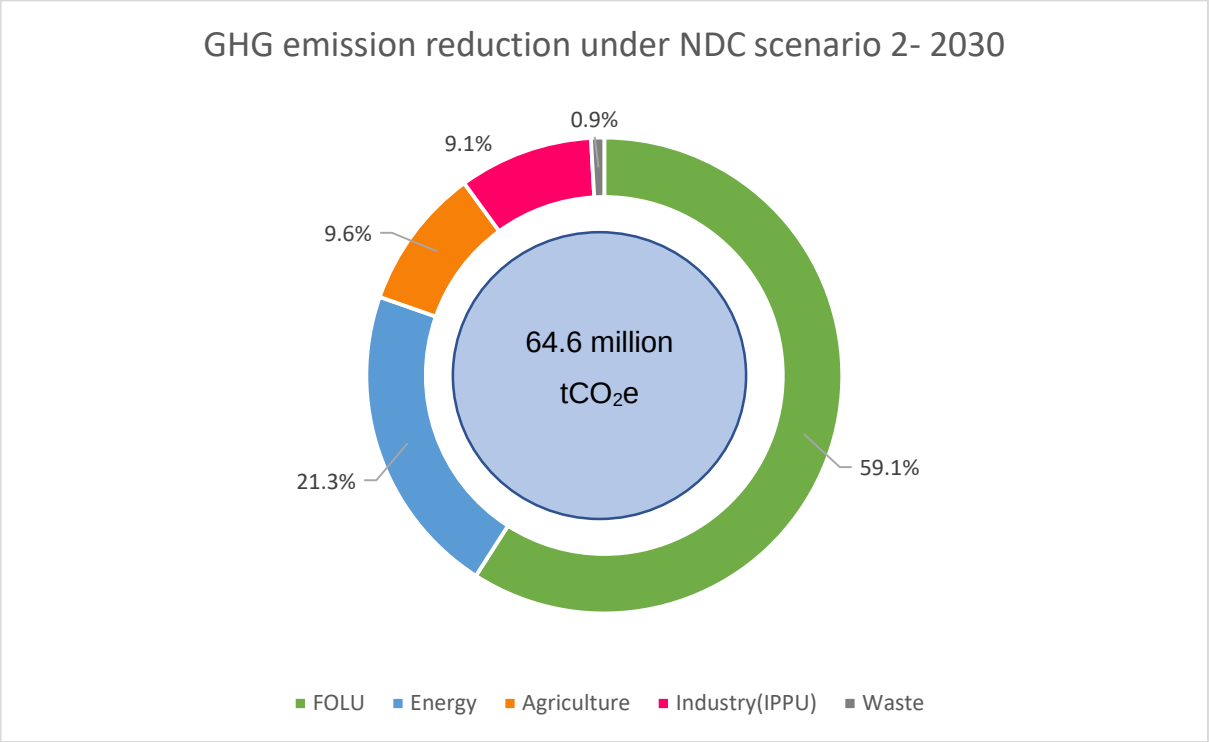


Figure 17 GHG emission reduction under the NDC scenario 2 in 2030

Source: NCSD (2020)

Table 19 Sectoral share and absolute number of GHG emissions reduction under the NDC scenario 2 in 2030

Sector	**Sectoral share (%)**	**GHG emission reduction ($MtCO_2e$)**
FOLU	59.1	38.1
Energy	21.3	13.7
Agriculture	9.6	6.2
Industry (IPPU)	9.1	5.9
Waste	0.9	0.6
Total	**100%**	**64.5**

Under the NDC scenario 2, an emission reduction of 64.6 million tCO_2e/year is expected by 2030. This is a 41.7 % reduction compared with the BAU case.

Even under this scenario, the FOLU is expected to provide the major share of the 59.1% reduction in emissions by 2030. Other sectors like energy (21.3%), agriculture (9.6%), Industry (IPPU) (9.1%), and waste (0.9%) are also expected to contribute in a significant way.

This approach will have an even wider participation than scenario 1 and will have even better resilience to failures in the mitigation activities. Yet one disadvantage of the involvement of many sectors could be the need for more experts in many fields. However, this could be considered as an opportunity to develop or strengthen Cambodia's capacity.

NDC Scenario 3 - Contribution by different sectors

The share of distribution of the planned emission reduction under the NDC scenario 3 among the various sectors is indicated in Figure 18 below.

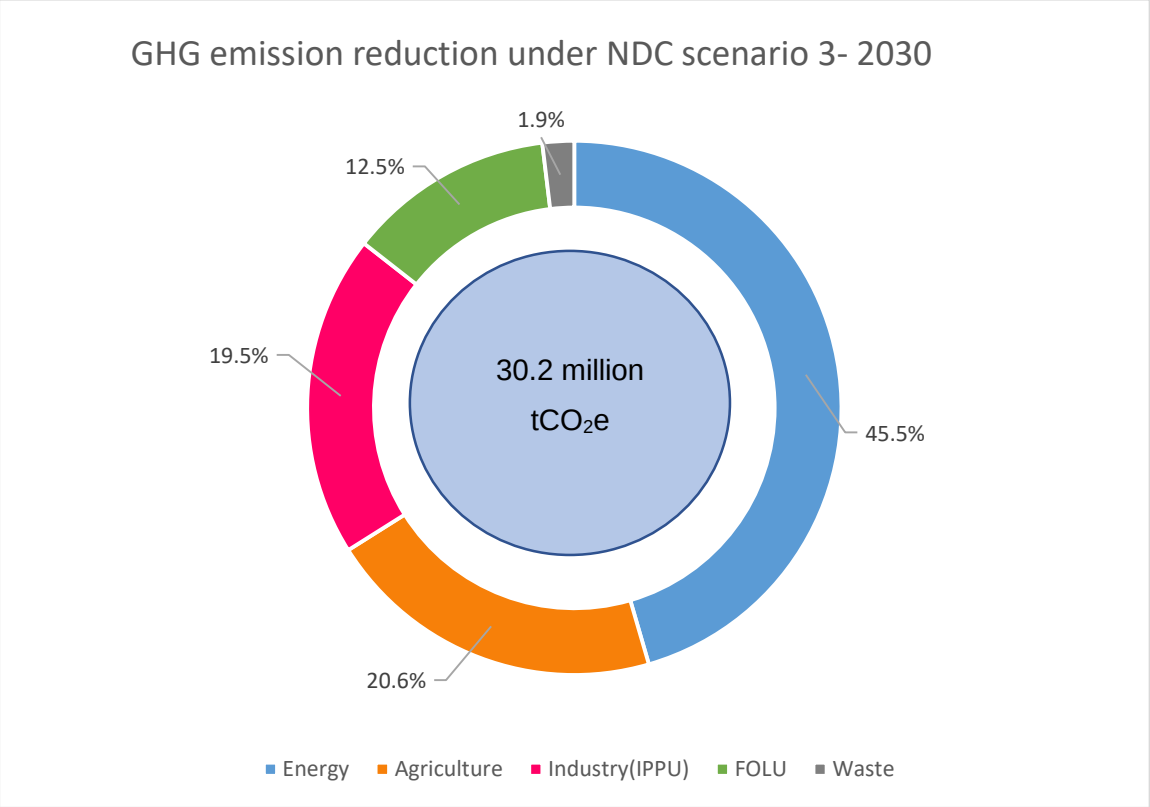


Figure 18: GHG emission reduction under NDC scenario 3 in 2030

Source: NCSD (2020)

Table 20 Sectoral share and absolute number of GHG emission reduction under the NDC scenario 3 in 2030

Sector	**Sectoral share (%)**	**GHG emission reduction ($MtCO_2e$)**
Energy	45.5	13.7
Agriculture	20.6	6.2
Industry (IPPU)	19.5	5.9
FOLU	12.5	3.8
Waste	1.9	0.6
Total	**100%**	**30.2**

Under the NDC scenario 3, the target emission reduction is 30.2 million tCO_2e/year by 2030, which is a 19.7 % reduction compared with the BAU scenario.

The main emphasis for emission reduction under this scenario is on the Energy sector (45.5%), followed by the Agriculture sector (20.6%). The Industry (IPPU) sector is at third place with a 19.5% expected contribution. The FOLU will also join with above sectors to make a more than 95% contribution in the emission reduction.

Placing less emphasis on the FOLU could be more socially acceptable as the rapid de-forestation of the country would have been linked to the expansion of agriculture. Expecting a 20.6% share of emission reduction from agriculture also may be more acceptable to rural farming communities. However, there could be an effect on soil, water and other natural resources not considered in the GHG mitigation study.

Mitigating emissions from the electricity sector will be directed mainly on renewable energy power generation. There will be barriers imposed by the availability and the absorption capacity of the grid which would have to be addressed for the achievement of the targets.

Mitigating transport sector emissions would require policy instruments and carbon pricing instruments to promote low emission transport modes. Social acceptance would depend on the chosen approaches, public awareness and the instruments used.

The other industrial sectors will expand and play a major role during Cambodia's development. Therefore, energy efficiency and the process of developing existing and new industries must be improved to minimize the effect on emissions. As the cost of the RE is on the reducing trend use of renewable energy will be a cost-effective mitigation strategy.

The RGC can decide on an NDC scenario to be followed based on the adaptability under the environmental, cultural, economic, technical and political conditions and priorities of the country.

Mitigation measures

The DCC of the GSSD, supported by CCCA, have been coordinating stakeholder engagement and collecting submissions from line ministries on priorities for the NDC revision for both mitigation and adaptation activities. The template used to ensure comparability across mitigation actions is the following.

Table 21 Template for ministerial submissions for Mitigation Projects

No	Mitigation action	Government priority	GHG mitigation potential	Targets	Co-benefits (environmental, social, adaptation)	Finance		Technology availability	Gender	Final score
						Costs	Benefits			
Scoring **Government priority:**										

1=not in line with a government priority

2= no government policy in place

3=in line with the government priorities

Mitigation potential (as example)

1= 0 k-15k,

2=15k-30k,

3=30k-60k,

4=60k-100k,

5=>100k tCO_2e/year

Targets:

1= target is difficult to reach

2= target is easy to reach

Co-benefits:

1= action does not have many co-benefits

2= action has many co-benefits

Finance:

1= cost/benefits= negative

2=cost/benefits=medium

2= cost/benefits= positive

Technology:

1= not available

2= available

Gender:

1= no impact on equality, no gender inclusion possible

2= medium impact on equality, medium gender inclusion possible

3= good possibility to build equality, gender inclusion

Mitigation actions were identified from the NDC related information provided by the relevant ministries (MAFF, MISTI, MLMUPC, MME, MoE, MOEYs, MoT, MPWT, and NCDD). These projects were filtered and a list of mitigation projects was prepared. The mitigation projects are distributed among seven mitigation sectors: energy generation, waste, industry, transport, agriculture, building, and the FOLU. Table 22 shows the identified list.

Table 22 Mitigation projects

No	Mitigation Projects/Activities	Lead Ministry	Sector
1	Promote sustainable energy practices in manufacturing *Garments: 2,291 $GgCO_2e$, 55% by 2030* *Bricks: 1,799 $GgCO_2e$, 44% by 2030* *Food and Beverage: 1,043 $GgCO_2e$, 25% by 2030*	MISTI	Other Industries
2	Urban Planning Tools for Climate Change Mitigation and the urban planning solution in three sub cities	MLMUPC	Building residential Building commercial
3	Application of electrical equipment's labelling & MEPS (Lighting, Cooling & Equipment) *Reduce 1.2 TWh (29.7%) of electricity use in 2030*	MME	Building residential Building commercial
4	Improvement of process performance of EE by establishment of energy management in buildings/industries *Voluntary scheme for other companies, especially for SMEs to reduce 10% in 2030*	MME	Other Industries Building residential Building commercial
5	Public awareness campaigns, DTEBP-EE info centres *Reduce 2% of energy consumption in 2030*	MME	Building residential Building commercial
6	Building codes and enforcement/certification for new buildings and those undergoing major renovation *Reduce 10% of electricity consumption in 2030*	MME	Building commercial
7	Introduction of efficient electrical motors and boilers *Reduce 2.3% of current electricity consumption in 2030*	MME	Building commercial Other Industries
8	Improve sustainability of charcoal production through enforcement of regulations	MME	Building residential
9	Roadmap study on Integration of RE (Renewable Energy) resources. *25 % of renewable energy in the energy mix (solar, wind, hydro, biomass) by 2030*	MME	Energy generation
10	New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill *Increase the share of waste disposed at sanitary landfills with LFG extraction from 0% in 2020 to 50% by 2030 and extract LFG from the Dangkor Landfill*	MoE	Waste -MSW Agriculture - land-related
11	Composting of biodegradable organic fraction of MSW supplemented with separation of organic waste (at source). *If 10% of all MSW generated is composted by 2030 then up to 500 $ktCO_2e$/year of GHG emissions can be avoided by 2030*	MoE	Waste- MSW
12	Production of Refuse-Derived Fuel (RDF) from either a) fresh MSW or b) old MSW mined from the Dangkor landfill.	MoE	Cement sector Waste -MSW

No	Mitigation Projects/Activities	Lead Ministry	Sector
	GHG ER from RDF + anaerobic digestion up to 200 $ktCO_2e$/year		
13	Implementation of National 3R strategy	MoE	Waste -MSW
14	Enhance maintenance and inspection of vehicle (Piloting maintenance and emission inspections of vehicles) *30 vehicle inspection centres in operation by 2030*	MPWT	Passenger transport
15	Promote integrated public transport systems in main cities	MPWT	Passenger transport
16	Reducing GHG emission though off grid street lightening of rural municipality *10 Sangkat of Senmonorom municipality, Kep municipality, and Preah municipality integration of climate change into financial management, institutional arrangement and policy reform by 2028.*	NCDD	Building commercial Building residential
17	Bio-digesters construction (85% reduction compared to 2000) (Small size (2-3-4m3)	MAFF	Building residential Agricultural land related
18	Bio-digesters construction (85% reduction compared to 2000) Medium size(6-8-10m^3)	MAFF	Energy generation Agricultural land related
19	Bio-digesters construction (85% reduction compared to 2000) Large size(>10m3)	MAFF	Energy generation Agricultural land related Waste -MSW
20	Centralized recycling facility for industrial waste from the garment sector *Reduce 108,472 tCO_2e/at an average of 10,847 tCO_2e/year*	MISTI	Waste -MSW
21	Climate-friendly cooling of public sector buildings *Reduce 43 000ton/year*	NCSD	Building commercial
22	Toward Battambang city to green city *5 Sangkat of Battambang municipality integration of green city by 2025*	NCDD	Building commercial & Residential
23	Shift long distance freight movement from trucks to train	MPWT	Freight Transport
24	Emission management from factories *Monitor air quality at 105 factories annually and provide permit letter on air emission to 90 factories.* *90% of factories to be licensed.*	MoE	Other Industry
25	Increasing the effectiveness and sustainability of agricultural land management techniques (Conservation Agriculture)	MAFF	Agriculture land-related
26	Organic input agriculture and bio-slurry; and deep placement fertilizer technology *10 Provinces by 2030*	MAFF	Agriculture land-related

No	Mitigation Projects/Activities	Lead Ministry	Sector
28	Promote manure Management through compost making process to reduce carbon emission *25 provinces and cities by 2030*	MAFF	Agriculture land-related
29	Better management of industrial wastewater in the food & beverage sector	MISTI	Wastewater
30	Implementation of National Cooling Action Plan	MLMUCP	Building commercial
31	Inclusion of performance requirements of Passive Cooling Systems in Building Energy Code of Cambodia	MLMUCP	Building commercial
32	Implementation of "passive cooling" measures in the cities (addressing urban heat island effect [UHIE]), public buildings and commercial buildings.	MLMUCP	Building commercial

Source: Ministries' submissions

Table 23 FOLU targets

No	FOLU target	Lead Ministry	Sector
1	FOLU NDC Scenario 1: 60% forest cover by 2030	MAFF, Rectangular Strategy IV, INDC	FOLU
2	FOLU NDC Scenario 2: Reduce 50% of historical emission by 2030	REDD+ Technical Secretariat (RTS	FOLU
3	FOLU NDC Scenario 3: INDC emission reduction (4.7 tCO_2e/ha/year)	INDC	FOLU

Source: Ministries' submissions and REDD+ Technical Secretariat (RTS)