

# GEF-8 REQUEST FOR CEO ENDORSEMENT/APPROVAL

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## General Project Information

Project Title

Enhancing the Climate Resilience of Urban Landscapes and Communities in Thimphu-Paro region of Bhutan (ECRUL)

Region

Bhutan

GEF Project ID

11109

Country(ies)

Bhutan

Type of Project

FSP

GEF Agency(ies):

UNDP

GEF Agency Project ID

6730

Project Executing Entity(s)

Ministry of Infrastructure and Transport (MoIT)

Project Executing Type

Government

GEF Focal Area (s)

Climate Change

Submission Date

6/27/2024

Type of Trust Fund

LDCF

Project Duration (Months)

72

GEF Project Grant: (a)

18,048,624.00

GEF Project Non-Grant: (b)

0.00

Agency Fee(s) Grant: (c)

1,624,376.00

Agency Fee(s) Non-Grant (d)

0.00

Total GEF Financing: (a+b+c+d)

19,673,000.00

Total Co-financing

62,186,000.00

PPG Amount: (e)

300,000.00

PPG Agency Fee(s): (f)

27,000.00

Total GEF Resources: (a+b+c+d+e+f)

20,000,000.00

Project Tags

CBIT: No NGI: No SGP: No Innovation: No

Project Sector (CCM Only)

Climate Change Adaptation Sector

## Taxonomy

Focal Areas, Climate Change, Sustainable Development Goals, Climate Change Adaptation, Climate resilience, Private sector, Disaster risk management, Least Developed Countries, Livelihoods, Paris Agreement, United Nations Framework Convention on Climate Change, Ecosystem-based Adaptation, Climate information, Influencing models, Convene multi-stakeholder alliances, Deploy innovative financial instruments, Strengthen institutional capacity and decision-making, Stakeholders, Local Communities, Civil Society, Beneficiaries, Non-Governmental Organization, Academia, Community Based Organization, SMEs, Private Sector, Individuals/Entrepreneurs, Financial intermediaries and market facilitators, Type of Engagement, Information Dissemination, Participation, Consultation, Partnership, Communications, Awareness Raising, Education, Gender Equality, Gender Mainstreaming, Sex-disaggregated indicators, Women groups, Gender-sensitive indicators, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Capacity Development, Integrated Programs, Sustainable Cities, Urban Resilience, Integrated urban planning, Green space, Urban sustainability framework, Capacity, Knowledge and Research, Knowledge Exchange, Conference, Field Visit, Knowledge Generation, Workshop, Training, Professional Development, Master Classes, Course, Learning, Adaptive management, Theory of change

## Rio Markers

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
No Contribution 0	Principal Objective 2	No Contribution 0	No Contribution 0

## Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. (max. 250 words, approximately 1/2 page)

Bhutan is highly vulnerable to climate change and a range of climate hazards. The project seeks to address the impacts of fluvial (riverine) and pluvial (surface water) flooding, cyclonic events, and water stress on the residents of Thimphu and Paro. These two cities, together making up 25% of the country's population, and representing over 40% of the country's GDP, and 46% of the urban population, face increasing risks due to climate change. With changes in extreme temperatures and in precipitation patterns as a result of climate change, the cities face increased urban flooding, landslides and forest fires affecting the economy, landscape and population. Existing infrastructure is inadequate and lacks sufficient climate-proofing, leading to increased risks. These risks are further compounded by a growing urban population. To mitigate these risks, there is an urgent need for nature-based solutions, resilient urban planning, and infrastructure development.

This project will directly benefit 146,298 residents (Thimphu Male: 58,996, Female: 55,555; Paro Male: 12,091, Female: 19,656) in the Thimphu-Paro region. It will focus on managing 800 hectares of watershed and springshed land, developing water retention systems, and upgrading early warning systems to enhance climate resilience. The project prioritizes gender-responsive planning for climate-adapted urban development pathways. Initiatives include training over 200 stakeholders and community members, developing local adaptation plans, and empowering communities through participatory processes and fostering entrepreneurship (especially among women and youth). Additionally, the project encourages private sector involvement through training, green financing, and public-private partnerships. By raising climate awareness and fostering behaviour change, the project will directly contribute to the increased resilience of Thimphu and Paro

## Project Description Overview

### Project Objective

To strengthen the management of climate risks, and reduce the vulnerability of urban landscapes and communities to the impacts of climate change in Thimphu-Paro.

## Project Components

### 1: Climate risk-informed, coordinated and inclusive planning and governance for resilient urban development.

Component Type	Trust Fund
Technical Assistance	LDCF
GEF Project Financing (\$)	Co-financing (\$)
4,490,000.00	16,450,000.00

Outcome:

1. Institutional coordination, stakeholder engagement and climate adaptation capacity strengthened for inclusive and

climate-resilient urban planning and development.

Output:

Output 1.1: Inter-agency mandates and functions harmonized, and institutional coordination mechanisms established and made functional to facilitate policy coherence for climate-resilient urban planning and development

Output 1.2: Climate and geospatial information systems established with trained urban planners to promote risk informed urban planning

Output 1.3: Climate-resilient and gender-responsive adaptation plans prepared for Thimphu and Paro with active citizen participation and added emphasis on climate resilient entrepreneurship

Output 1.4: Educational and training programmes introduced in colleges and technical schools for skilling, reskilling and upskilling of planning professionals and workforce

Output 1.5: Innovative financing solutions for public and private sector to invest in climate-resilient projects, technologies, and services

### 2: Build Resilience through gender-responsive climate adaptive approaches

Component Type	Trust Fund
Technical Assistance	LDCF
GEF Project Financing (\$)	Co-financing (\$)
11,599,166.00	36,655,000.00

Outcome:

2. Climate risk management measures designed and implemented for water management systems and urban infrastructure

Output:

Output 2.1: Climate-proofing features for the key sections of the water and stormwater management systems introduced to ensure flood risk management, safe and uninterrupted water supply and business continuity in critical urban areas

Output 2.2: Ecosystem and NbS developed and implemented to adapt to floods, heat-island effect, and landslide and to enrich water sources, natural streams and catchments for improved infiltration, restoration and recharge

Output 2.3: Measures to increase climate resilience of buildings and design of urban spaces introduced

Output 2.4: Ancillary rainfall threshold-based flood EWS developed on critical tributaries and integrated with the existing centralized hydro-met data management system (CDMS) of NCHM

### 3: Knowledge management, gender-responsive monitoring and evaluation

Component Type	Trust Fund
Technical Assistance	LDCF
GEF Project Financing (\$)	Co-financing (\$)
763,000.00	5,775,000.00

Outcome:

3: Project knowledge is managed, and project results are monitored and evaluated to foster learning, adaptive management, sustainability and replication

Output:

Output 3.1: Knowledge and communication products and platforms developed to analyse and disseminate best practices and project lessons

### M&E

Component Type	Trust Fund
Technical Assistance	LDCF
GEF Project Financing (\$)	Co-financing (\$)
337,000.00	

Outcome:

3: Project knowledge is managed, and project results are monitored and evaluated to foster learning, adaptive management, sustainability and replication

Output:

Output 3.2: Project progress and results are effectively tracked and managed through monitoring and evaluation

### Component Balances

Project Components	GEF Project Financing (\$)	Co-financing (\$)
1: Climate risk-informed, coordinated and inclusive planning and governance for resilient urban development.	4,490,000.00	16,450,000.00
2: Build Resilience through gender-responsive climate adaptive approaches	11,599,166.00	36,655,000.00
3: Knowledge management, gender-responsive monitoring and evaluation	763,000.00	5,775,000.00
M&E	337,000.00	
<b>Subtotal</b>	<b>17,189,166.00</b>	<b>58,880,000.00</b>
Project Management Cost	859,458.00	3,306,000.00
<b>Total Project Cost (\$)</b>	<b>18,048,624.00</b>	<b>62,186,000.00</b>

Please provide Justification

## PROJECT OUTLINE

### A. PROJECT RATIONALE

Describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

#### Project's context:

**Bhutan is a small landlocked country in the Eastern Himalayas, occupying 38,394 km<sup>2</sup> between China in the north and India in the south, east, and west. High snow-capped peaks and alpine pastures occupy the north, and the mid-ranges are covered with temperate forests in deep, north-to-south valleys and hills created by fast-flowing rivers. The southern foothills comprise alluvial plains with broad river valleys and sub-tropical forests. About half of Bhutan's rugged terrain has slopes greater than 50%, and ≈52.45% of its land area is over 2,600 meters above mean sea level. The country, with its fragile mountainous ecosystems, is part of a global biodiversity hotspot. Bhutan is among the least populated countries in mainland Asia, with a population of 727,145 (47.7% F 52.3% M) and a population growth rate of 1.3%. Meadows cover 2.51%, shrubs, 9.74% and 5.35% of Bhutan is under snow and glaciers. 51.44% of the total area is protected, and only 2.75% or 112,556.2 hectares constitute cultivated agricultural land.**

In recent years, Bhutan has been experiencing rapid urbanization growth with 39% of Bhutan's population living in urban areas as of 2022<sup>[11]</sup> with growth highest among South Asian countries<sup>[2]</sup>. Climate change is influencing Bhutan's trend of urbanisation by impacting its water resources, agriculture, and natural environment. Bhutan's growing cities need improved climate resilience. Urbanisation, particularly rapid growth in Thimphu (holding 40% of the national urban population) and Paro, are straining resources and infrastructure.<sup>[3]</sup> Bhutan's urban centres are unevenly distributed. Combined with urbanisation this is causing land pressure and unplanned suburban development. These river valley cities already face inherent flood risks, water stress and other climate induced hazards. The situation is escalating as the climate projections suggest a significant increase in droughts, floods, and heatwaves, leading to urban flooding, landslides, and forest fires.<sup>[4]</sup> These projections are reinforced and validated in the latest projections by the NIES (Forthcoming, NIES 2024). In the long run, this will affect Thimphu and Paro's economy, livelihood activities, landscape, and population with women and other vulnerable groups experiencing disproportionate impacts and increased cost of responding to these challenges.

The Ministry of Infrastructure and Transport (MoIT) plays a central role in Bhutan's urban development. The Ministry develops national-level policies and strategies and coordinates national and regional plans. Local governments, such as the Thimphu and Paro municipal governments, are responsible for overseeing urban services and infrastructure within their jurisdictions. Within the Ministry, the Department of Human Settlement (DHS) has a mandate to coordinate and harmonize inter-agency mandates and functions including coordinating with diverse stakeholders (including private and corporate entities) to achieve integrated urban development outcomes.

### Climate Change – current situation and historical trends

Bhutan is the 38<sup>th</sup> most vulnerable country and the 62<sup>nd</sup> most ready country for climate change impacts, according to the ND-GAIN Index<sup>[5]</sup>. Bhutan has experienced temperature increases since the 1960s, with minimum temperatures increasing faster than maximum temperatures<sup>[6]</sup>. The mean annual temperature in Bhutan has increased by 0.8 degrees Celsius. Similarly, seasonal temperature has also increased, with the highest increase of 1.3



degrees during winter<sup>[7]</sup>. Higher temperatures are projected to contribute to increased snowmelt which could change patterns of river discharge and water availability<sup>[8]</sup>.

Flooding is considered the most significant climate-related hazard faced by Bhutan with most of the country's infrastructure being located along drainage basins, which are highly vulnerable to heavy monsoon rains and glacial lake outbursts. For instance, in 2016, flooding impacted the Phuentsholing - Thimphu highway in several locations. As this highway is a major supply line for food and fuel from India, Thimphu's residents feared they would experience food and fuel shortages during this flood. This flood event had a significant economic impact, causing a 0.36% reduction in Bhutan's gross domestic product<sup>[9]</sup>. Cyclone Aila in May 2009 led to severe flash floods across the country, particularly around Thimphu. It resulted in loss of twelve lives and caused property damage worth USD 17 million<sup>[10]</sup>. Cyclone Aila also led to severe flooding and property loss in Paro, threatening its international airport operations and recorded the highest rainfall of 107.4 mm/day in 2009<sup>[11]</sup>. Additionally, during heavy rain in Thimphu, sewer overflow onto major roads within Thimphu city core has become frequent with higher intensity.<sup>[12]</sup> Similarly, in 2000, a major flood shut down the Thimphu highway for a month and the same flood altered the paths of the Amochu and Omchu<sup>[13]</sup>. According to the survey conducted as part of the project development (see Annex 10), households in Thimphu (30%) and Paro (25%) have suffered extreme weather events like heavy rainfall, floods, landslides, and severe drought during the last 5 years. The extreme weather conditions impacted household livelihoods, and damaged infrastructure. Twenty one percent of households reported damage to houses, water supply, and roads, and 59% of households reported damage worth Nu 5,000 (USD 60) to Nu 10,000 (USD 120).

Natural calamities during the past year, potentially exacerbated by climate change, were also significant: In Thimphu, 16% households faced forest fire as recurring problem, 29% households were affected by landslides, flash floods, and severe drought conditions. In Paro, 34% faced flash floods and droughts and 12% households faced forest fires. Further details are given in Gender Analysis and Action Plan (GAAP - Annex 10).

### Future projections

Future climate projections indicate a significant temperature increase. For instance, the national level projection from the National Institute for Environmental Studies (NIES), Japan,

shows that Maximum temperature and Minimum temperature are likely to increase across Bhutan under RCP 4.5 and RCP 7.0 and all timescales (2021-2040, 2041-2060 and 2081-2100). Maximum temperature increases more in the central and northern parts of Bhutan, and both Thimphu and Paro are part of the Central region of Bhutan. Such temperature increase will lead to heat waves and urban heat island effects in the Thimphu and Paro regions. The increase in temperature in Paro and Thimphu ranges from around 2 °C under the medium-term medium pathway(SSP2-4.5) to around 4.4 °C under the long-term worst-case scenario (SSP370)<sup>[14]</sup><sup>14</sup>.

As cities like Thimphu and Paro grow, new roads and buildings will displace natural environments like trees, wetland/ponds, and soil. Temperature increase could heighten the effects of heat waves, leading to even higher temperatures in these urban areas. Heat waves also pose a threat to vulnerable groups, including the elderly, children, pregnant women, and those with respiratory illnesses, due to the increased risk of heat stroke or heat exhaustion from prolonged exposure to high temperatures. Heat waves can lead to higher evaporation rates, reducing water availability in rivers, streams, and reservoirs.

The current median probability of a heat wave in Bhutan is around 2%. By the 2090s, this is projected to increase dramatically, with the probability rising to approximately 20% under RCP4.5 and RCP6.0 and as high as 36% under RCP8.5<sup>[15]</sup><sup>15</sup>. Overall, the existing climate models show a trend of consistent warming that varies by emissions scenario (See Annex 19)<sup>[16]</sup><sup>16</sup>.

Along with existing high-resolution climate projections, lower-resolution national projections indicate similar maximum temperature increases (See Annex 23). Using the lower-resolution projection data from the National Institute for Environmental Studies (NIES), Japan, the project team studied the 1km\*1km projection of Bhutan and found a similar temperature increase. For these projections, the increase in maximum temperature in Paro and Thimphu project area ranges from around 1.24 °C under the near-term best-case scenario (SSP1-2.6) to around 2.12 °C under the medium-term (2041-2060) worst-case scenario (SSP3-7.0). Rising temperatures can also impact water resources by accelerating the rate of snowmelt. As temperatures increase, snow will likely become rain, and snowmelt will likely begin earlier, thus, peak river discharge may also occur earlier<sup>[17]</sup><sup>17</sup>. These conditions could increase the potential for riverine flooding, which can impact populations and infrastructure near rivers. Among the project areas, Kawang, sub-district in the north of Thimphu, is expected to witness the highest maximum temperature increase of 2.12°C during 2041- 2060 under SSP3-7-0. The climate rationale (Annex 23) provides the 1km\*1km projection of different project areas.

Like maximum temperature, precipitation is likely to increase across Bhutan under all scenarios and all timescales (See Annex 23). The increase in precipitation in Paro and Thimphu ranges from around 56 mm under the medium-term medium pathway scenario (SSP2-4.5) to around 375 mm under the long-term worst-case scenario (SSP3-7.0)<sup>[18]18</sup>.

This increase in precipitation has already been observed through the already higher incidence of pluvial and riverine flooding in Thimphu and Paro in the past decades. An increase reported in a 2022 academic study<sup>[19]19</sup> shows that since 1968, Thimphu and Paro Dzongkhags have experienced 6 major riverine and flash flooding events, affecting over 10,000 people. Out of 116 flooding events analysed nationwide in the 1968-2020 period, 65 events occurred over the 2012-2020 period across the country, showing an increasing trend.<sup>[20]20</sup> This trend is also seasonal due to more precipitation during the monsoon period. The Wangchuu basin, the basin encompassing Thimphu and Paro, experiences large fluctuations. During the dry season (January/February), it can drop as low as 3-5 cubic meters per second (m<sup>3</sup>/s), while in peak monsoon months (August/September), it can surge to 135 m<sup>3</sup>/s in some years.<sup>[21]21</sup> In the future, in both Thimphu and Paro districts, the frequency of 1-in-10 year events and 1-in-30 year events of maximum flow in their respective catchment areas as a result from rainstorm events is projected to increase under all emissions scenarios for both 2035 and 2085.<sup>[22]22</sup>

Similarly, cyclonic activity in Bhutan is also growing. In 2009, Cyclone Aila led to severe flooding and property loss in Paro, threatening its international airport operations, and recorded the highest rainfall of 107.4 mm/day in 2009<sup>[23]23</sup>. The Bay of Bengal and the Indian Ocean warm significantly during certain periods, especially pre- and post-monsoon seasons, with sea surface temperature (SSTs) often exceeding 28°C. These SSTs have already risen by 0.2 to 0.3°C, with projections indicating a further increase by 2.0 to 3.5°C by the end of this century<sup>[24]24</sup>. This warming boosts cyclonic activity, as warmer waters provide more energy for cyclones, making them more likely and stronger as SSTs rise.

Furthermore, projections indicate a 20% probability of experiencing potentially damaging and life-threatening urban floods in Thimphu<sup>[25]25</sup> and Paro over the next decade, posing a

threat to the livelihood of thousands of people and urban communities<sup>[26]</sup><sup>[26]</sup>. Projected increases in the number of days with very heavy precipitation further increases the risk of flooding and impact runoff, erosion, and river discharge rates. The CCKP model ensemble projects a 10-15% increase in the volume of water falling during a 5-day extreme rainfall episode by the 2050s<sup>[27]</sup><sup>[27]</sup>. The projected damage from flooding (SSP 2-4.5) is also concerning, starting at 7.1 million in 2030 and rising to USD 110 million by 2080.

## Implications

Despite being a carbon negative country, Bhutan is already experiencing the adverse effects of climate change. Rising temperatures and accelerated snowmelt will threaten water supplies by disrupting river flow patterns, drying up springs, reducing recharge capacity, and exacerbate flooding.<sup>[28]</sup><sup>[28]</sup> Changes in seasonal precipitation are expected, with longer dry spells in January and December, which create an ideal environment for devastating wildfires.<sup>[29]</sup><sup>[29]</sup> <sup>[30]</sup><sup>[30]</sup>

By the year 2050, it is expected that Bhutan's Gross Domestic Product (GDP) might drop by 1.4 percent due to the average economic harm caused by climate change effects<sup>[31]</sup><sup>[31]</sup>. Water is one of Bhutan's most abundant resources and is critical in supporting tourism, renewable energy, construction and manufacturing industry, forestry and agriculture. Both Thimphu and Paro are in river basins, which depends primarily on glacier melt, snow, and seasonal rainfall.

In future, the impact of climate change will be severe on Bhutan's urban infrastructure, disproportionately impacting vulnerable people's health and livelihoods. According to the World Bank's Climate Risk Country Profile for Bhutan, the impacts on infrastructure, predominantly from flooding, will grow significantly in the second half of the 21st century. The impact of flooding on human health and livelihoods is expected to grow and could be 4% of GDP by the 2030s<sup>[32]</sup><sup>[32]</sup>. Ultimately, this will also affect Bhutan's economic progress, since Thimphu and Paro are its major economic hubs. Prioritising Thimphu is both urgent and crucial since it contributes about 45% of Bhutan's GDP and 46% of the total business enterprises in Bhutan are based in Thimphu<sup>[33]</sup><sup>[33]</sup>. Paro is a crucial area considering the

increasing role of its international airport and tourism sector. Also, Paro has the potential to serve as an extension of both the administrative and commercial hubs, leveraging its strategic location, infrastructure, and resources to bolster economic activities. Additionally, within the context of the upcoming National Capital Region, both Thimphu and Paro will experience higher infrastructure and economic growth, thus necessitating climate-proofing of the investments. Both regions need a more comprehensive approach to climate action, including implementing measures to enhance the resilience of communities and ecosystems to climate change impacts.

Extreme weather events like flooding and heat waves put vulnerable groups at greater risk of property damage or displacement, leading to the loss of both shelter and livelihoods. Women and vulnerable populations frequently work in informal sectors, such as agriculture and urban economies, which are highly susceptible to climate-related disruptions. The loss of livelihoods due to climate impacts can further exacerbate poverty among these groups., as events like flooding or landslide activation can lead to displacement, with vulnerable groups often living in areas more prone to these events. Additionally, in urban and peri-urban areas of Thimphu and Paro, some women are engaged in tasks related to natural resources and are significantly impacted by changing weather patterns and extreme events, affecting their personal health, security, and workload.

### Water shortages

Despite being one of the most water-abundant countries in the region, with an estimated water availability of 109,000 m<sup>3</sup> per capita per year, Bhutan faces challenges with drinking water<sup>[34]</sup><sup>[34]</sup>. Statistically, in about 50% of the urban areas, water supply is not continuous, ranging from 6 to 12 hours of availability daily.<sup>[35]</sup><sup>[35]</sup> Often, locals have to rely on nearby streams, groundwater, and other local water sources as alternatives to cope with this scarcity. Existing reservoirs and water infrastructure cannot store excess water during heavy rainfall, leading to wastage. Traditionally, Thimphu's water schemes were designed based on a small valley basis, drawing from the Wang Chhu river and its tributaries. A similar approach has been adopted for Paro. While this approach has been cost-effective, balancing local water demand with supply is becoming a growing challenge. A demand analysis conducted by the Japan International Cooperation Agency (JICA) predicts a potential shortfall of up to 10 million litres per day (MLD) in the central and northern parts of Thimphu in the coming decade if the current pace of urban development persists.<sup>[36]</sup><sup>[36]</sup> While this study mainly assesses the impact of urbanization on Thimphu's water scarcity, climate change could exacerbate the predicted water shortfall in Thimphu.

In fact, future projections indicate a decline in dry season water flow in the Wangchhu River basin, where both Thimphu and Paro are located. According to [Zam et al. \(2021\)](#), the future river flow in the Wangchhu River basin is expected to reduce by 5.77 % and 4.73 % under RCP 4.5 and RCP 8.5 climate scenarios with respect to the baseline period 1990–2005. Their study also revealed that most of the discharge is projected to be reduced during the dry season and increase during the wet season<sup>[37]37</sup>. Such a decline in dry season water flow can lead to water scarcity and have significant economic consequences for the residents of the Thimphu and Paro regions, including increased water supply costs. The National Integrated Water Resources Management Plan<sup>[38]38</sup> highlights the threat of climate change to drinking water supply, and highlights the concern over the availability of drinking water as many spring water sources are drying up. Therefore, it's crucial to continue with implementation of strategies for managing water resources, including advancing water conservation and infrastructure resilience measures, like water storage facilities for communities.

### UHI effect

The Urban Heat Island (UHI) effect exacerbates climate change impacts by increasing local temperatures in urban areas. A recent study on the Urban Heat Island (UHI) effect in Thimphu, Bhutan, shows that rapid urban growth, caused by population increase and poor land use planning, has transformed agricultural land into concrete structures. This urbanization has led to a steady rise in land surface temperatures, especially in the city's central areas, creating UHI zones. The study found a strong link between higher temperatures and the number of built-up areas, indicating that urban development significantly heats up the city.<sup>[39]39</sup>

### Flooding

Studies indicate an increasing trend in flooding events across Bhutan, with 65 events occurring between 2012-2020 compared to 41 during 1968-2011<sup>[40]40</sup>. Under climate change scenario SSP2-4.5, long-term projections suggest the precipitation increase to around 160mm for Thimphu and 157 mm for Paro. For SSP 3-7.0, long-term projections suggest the precipitation increase to around 375mm in Thimphu and 377 mm for Paro<sup>[41]41</sup>. Such significant projections of precipitation rates, including variability, can lead to flooding, but also challenges like waterlogging, damaging infrastructure, displacing residents, and disrupting daily life.

Bhutan's water management infrastructure, such as levees and drainage systems, is becoming increasingly stressed under extreme rainfall events, leading to frequent



overflows. In 2016, flooding created panic in Thimphu. During this flood, the Phuentsholing -Thimphu highway was impacted in several locations. The Kamji Bridge along the Phuentsholing -Thimphu highway partially collapsed due to flooding. This national highway linking Thimphu and Paro airport is considered one of the most critical roads in Bhutan, serving as the primary route for transporting essential goods such as raw materials, fuel, medication, and manufactured products<sup>[42]</sup><sup>[42]</sup>. Thimphu's residents panicked with food and fuel shortages during this flood. This flood event also had a significant economic impact, causing a 0.36% reduction in Bhutan's gross domestic product<sup>[43]</sup><sup>[43]</sup>.

Thimphu and Paro's existing infrastructure was not designed to manage the increased volume of water resulting from extreme rainfall events. Stormwater management systems lack sufficient coverage and appropriate technical design. Moreover, excessive use of concrete and limited adoption of green and resilient construction methods have diverted natural watercourses, leading to high surface runoff and stormwater overflowing into streets and buildings during intense rainfall. As a result, the infrastructure is becoming overloaded, leading to surface water flooding, erosion, damage to infrastructure and businesses, and ultimately posing a potential risk of loss of life.<sup>[44]</sup><sup>[44]</sup>

## **Landslides**

Both Thimphu and Paro have faced numerous landslides historically, mainly influenced by their geographical and geological features, rainfall patterns and anthropogenic activities. Landslides often damage roads, water, electricity supply, and other infrastructure systems and assets. Based on the households survey carried out as a part of project development (see Annex 23) 20% of households reported that they experienced livelihood disruption due to landslides.

According to World Bank's Think Hazard database projection, landslides as a major risk for Thimphu and Paro. Climate change, together with increased human activities, can affect the stability of slopes and bedrock. Altered precipitation patterns can make soil more susceptible to movement, resulting in larger landslides, as higher precipitation can increase pore water pressure within slopes, reducing their stability. Climate change can also affect vegetation patterns. For instance, increased temperatures and changes in rainfall can affect the growth of vegetation that helps stabilize slopes.

## **Non-climate drivers**

Several non-climate drivers exacerbate the impacts of climate change. These include:

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***Steep Terrain and Landscape Features:*** The Thimphu and Paro valleys' mountainous landscape makes them naturally prone to landslides and flash floods. These hazards are amplified by climate-induced changes in rainfall and human activities such as deforestation.

***Rapid Urbanisation:*** The swift growth of Thimphu and Paro increases demand for housing and infrastructure. This leads to unplanned development, straining existing resources, and amplifying the impact of weather events. According to population projections from Bhutan's National Statistics Bureau (NSB), the population of Thimphu is expected to almost double, while Paro's population is projected to grow by 60%, considering period from 2017 to 2047<sup>[45]</sup><sup>[45]</sup>.

***Conversion of Permeable Surfaces:*** Expanding urban areas have replaced natural groundcover with impermeable surfaces (concrete, asphalt). This reduces infiltration and worsens runoff, increasing flood risks, especially during intense precipitation events. Furthermore, there is evidence that impervious surfaces can increase water stream temperatures (for every 1% temperature increase, the average urban stream water temperature can increase by 0.08C. <sup>[46]</sup><sup>[46]</sup>

***Inadequate Water Management Systems:*** Outdated and insufficient water systems struggle to meet the needs of the growing population and are further strained by changing rainfall patterns. This exacerbates the risks of water scarcity during droughts and increased risks of flooding during heavy rains.

***Low Maintenance of Drainage and Sewerage System:*** Poorly maintained drainage and sewerage systems cannot handle increased precipitation and are more likely to become overwhelmed. This can lead to localized flooding, water contamination, and public health risks.

***Nascent Level of Urban Resilience Practices:*** Climate-resilient urban planning is a relatively new concept in the region. There is limited knowledge of nature-based solutions and technologies, and low level of investments to prepare for and mitigate the impacts of climate change.

By acknowledging these non-climate drivers alongside climate risks, the project will adopt a more comprehensive approach to building urban resilience in Thimphu and Paro. This ensures that the region is not only prepared for climate change but also adaptable to other social, economic, and environmental challenges.

## **Baseline national and local policy framework**

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The proposed project aligns with these including international commitments, particularly those concerned with climate change, water resource management, disaster risk reduction and the built environment. A summary is presented below with a detailed description in the technical analyses report, including local and regional level plans.

#### **National plans contributing to international conventions:**

On a national level, Bhutan has a well-developed set of institutions, policies and initiatives contributing to international climate change commitments, water resource management, disaster risk reduction and built environment, such as:

- **Bhutan's First NDCs (2015)** outlines adaptation priorities for the country, some of which are aligned with the project: climate proofing water distribution and storm water management systems, develop a monitoring, assessment, and warning systems for flash flood and landslide hazards and risks.
- **Climate Change Policy of the Kingdom of Bhutan (2020)** aims to enable a climate-resilient and carbon neutral development. It sets four major objectives of pursuing carbon-neutral development, building resilience to climate change, ensuring adequate technology, capacity building for implementation of the policy, and establishing an effective and coordinated action to address climate change. The policy prioritizes ecosystem adaptation as one of the climate change actions. It sets the basis for the creation of Bhutan's Nationally Determined Contributions (NDCs) and National Adaptation Plan (NAPs).
- **Bhutan's National Adaptation Plan (2023)** has revolves around various sectoral objectives of the NAP: water (improving natural capacity for infiltration and reducing water runoff, institutional capacity for water management), human settlements (strengthening institutional and policy environment to enable climate resilient planning and implementation), climate services and disaster risk reduction (DRR) (real-time monitoring and forecasting of water flows). The NAP for human settlement recommends securing ecosystem services in the form of 'green infrastructure' around and within human settlements are nature-based solutions for both mitigation and adaptation.
- **Long Term Low GHG emission and Climate Resilience Development (2023)** has the following objectives: 2) Enhancing disaster preparedness and response; 3) Integration

of environmental management measures in development activities that pose significant risks of land degradation; 4) Promote environmentally friendly and climate-resilient roads and infrastructure; 7) Ensure green, sustainable settlements; 17) Institutionalize and implement integrated water resource management; 20) Prevent damage from flood disasters.

- Bhutan's National REDD+ Strategy & Action Plan of Bhutan (2020) includes the establishment of plantations to provide sustainable wood-based products supply, increase carbon-stock, enhance biodiversity; and promotion of enterprises that sustainably manage NWFP. The strategy includes broadening opportunities for income generation from ecosystem services and developing climate-smart approaches in agriculture.

Other relevant national plans include:

- Constitution of Bhutan (2008) obliges the RGoB to protect, conserve and improve the pristine environment and safeguard the biodiversity of the country; prevent pollution and ecological degradation; Secure ecologically balanced sustainable development while promoting justifiable economic and social development; and ensure a safe and healthy environment.
- National Disaster Management Strategy (2016) is specifically concerning the implementation of priority action 2 - strengthening risk governance system and priority action 4 - strengthening disaster management capabilities. This strategy contributes to the national implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030.
- Bhutan's Water Act (2011) aims to ensure that the water resources of Bhutan are protected, conserved and managed in an economically efficient and environmentally sustainable manner and to establish suitable institutions for this task. It also includes measures in case of water emergencies such as droughts and floods.
- National Integrated Water Resources Management Plan (2016) establishes the framework and priorities for the implementation of integrated water resources management (IWRM) in Bhutan. The Plan is based on a baseline analysis and future climate change scenarios. In this baseline analysis, the plan identifies the districts of Thimphu and Paro's sub-basins as areas susceptible to monsoon flooding. The Plan establishes the principles and mechanisms under which agencies involved in the water sector, together with river basin stakeholders, can coordinate their respective plans and

activities, as well as collectively monitor progress toward attainment of Bhutan's IWRM objectives.

- **Bhutan Water Vision (2025)** sets as one of the goals to achieve safe water supply with 100% coverage in urban areas, and identifies flood control and management as a priority.
- **National Human Settlement Strategy (2017)** is led by the Ministry of Infrastructure and Transport and recognises rapid urbanization of settlements in urban and peri-urban areas, and the pressure they pose on the environment. As one of its main actions, disaster mitigation measures will be implemented through the development guidelines in disaster risk-prone areas and capacity building and training for disaster preparedness.
- **National Human Settlement Policy of Bhutan (2019)** requires environmentally sensitive areas, including biodiversity hot-spot areas identified in the national land-use plan and in settlement areas to be protected including protection and management of watershed areas and water resources for consumption, farming, and conservation of ecosystems.
- **Gender Equality Policy (2020)** ensures that gender is mainstreamed in all strategies, plans and programs. It provides an effective framework within which laws, policies, programmes and practices ensure equal rights, opportunities and benefits for women and men in the family, community, workplace and in society at large. Mainstreaming gender in all disaster and climate change related initiatives is added as one of the recommendations for achieving gender equality.
- **Economic Development Policy (2016)** is to facilitate and stimulate sustainable economic growth in keeping with the commitment to remain carbon neutral. It encompasses major economic reforms including the restructuring of the macroeconomic base which will include hydropower, service industry, organic farming and IT enabled knowledge society. The specific areas include finance, FDI, trade, industry, agriculture, transport, education, health, tourism, public sector and other legislative initiatives.
- **Thimphu Structure Plan 2022-2047** aims to transform Bhutan's capital city, Thimphu, into a sustainable urban hub. This comprehensive plan focuses on various aspects, including the building industry, housing, education, social and cultural development, and the environment. It seeks to permeate green streets and corridors, ensuring high-quality and accessible green infrastructure. By managing urban growth pressures and fostering resilient development, the TSP aligns with Thimphu's unique heritage and landscapes

- **National Environment Protection Act (2007)** states a person has the fundamental right to a safe and healthy environment with equal and corresponding duty to protect and promote environmental well-being.
- **Thimphu's Green Infrastructure Master Plan (2030):** The Green Infrastructure and Open Space Masterplan for Thimphu Thromde and Its Peripheral Areas outlines a vision for Thimphu, Bhutan, emphasising green infrastructure, climate resilience, and cultural heritage. It aims to restore harmony between people and nature, celebrate traditional Bhutanese identity, support sustainable economic growth, and deliver resilience benefits for the city. Key components include the Wang Chhu Corridor, green corridors, open spaces, and landscape design strategies. The plan emphasises protection, connectivity, and provision of green spaces to enhance quality of life and climate resilience.
- **Thimphu Integrated Stormwater Management Plan (2021-2030):** The Integrated Stormwater Management Plan (ISWMP) for Thimphu Thromde (2021-2030) addresses climate change impacts on stormwater management. It considers changing monsoon patterns, increased rainfall intensity, and rising temperatures. The plan proposes structural (drainage infrastructure) and non-structural (awareness campaigns) measures to enhance resilience. An investment requirement of Nu.1,366.3 million (Approx USD 16.46 million) is estimated over 10 years aims to create a sustainable stormwater system while mitigating urban flooding risks.

## Baseline projects and investments

The Royal Government of Bhutan, the Paro and Thimphu districts, and the Thimphu Thromde (municipality) have started to make strategic efforts to protect cities against hazards such as flooding and landslides. Bhutan's National Adaptation Plan (NAP) projects a need for USD 204.9 M from 2023-2038 for adapting to water-related impacts of climate change across rural and urban areas, with the bulk of this budget allocated to agricultural uses and water security. The same plan includes proposed initiatives related to climate-proofing critical infrastructure and settlements against floods and landslides, and for implementing green infrastructure to enhance urban resilience to climate change. Plans are included in the NAP for the implementation of Thimphu's Green Infrastructure Master Plan by 2030, which is a part of the Thimphu Structure Plan.

The Royal Government of Bhutan's (RGoB) 12<sup>th</sup> Five Year Plan (FYP) allocated significant resources for achievement of the National Key Result Areas, of which areas "6 - Carbon Neutral, Climate and Disaster Resilient Development Enhanced", "7 - Quality of Education & Skills Improved", "9 - Infrastructure, Communication & Public Service Delivery Improved" and "15 - Safety and Sustainability of Human Settlements Improved" are related to this

project. The 12<sup>th</sup> FYP though concluded in 2023, provided a strong foundation and roadmap to identify climate-proofing infrastructure as one of the key priorities for the 13<sup>th</sup> FYP, which is under development<sup>[47]</sup><sup>[47]</sup>. Moreover, there are ongoing national government initiatives such as National Spatial Data Infrastructure, led by the National Land Commission, aimed at centralising GIS data and coordinating with relevant ministries, which is designed to improve climate change planning.

At the local level, there is also recognition of rapid urbanisation in cities and the risk for climate change to exacerbate existing hazards like flooding and landslides. Namely, Thimphu Integrated Stormwater Management Plan (2021-2030) directly addresses this issue through four programmes, which are climate-resilient stormwater infrastructure, emergency response and recovery, strengthening institutional coordination, and stakeholder capacity building. This amounts to USD 24.56 M for implementation of various activities by the end of 2030. While the Paro Valley Development Plan, and the Paro -Thimphu Regional Strategy identify green infrastructure areas and outline design provisions, they lack specifics on funding sources and amounts. Urban unemployment rates in Bhutan are high<sup>[48]</sup><sup>[48]</sup>, particularly among individuals under 25 years old, with women facing higher rates than men. This has been evidenced by survey and focus group data from Thimphu and Paro collected during the project design. The Thimphu and Paro Regional Strategy targets employment growth in these urban centres, aiming to create 7,000 and 62,100 jobs in Paro and Thimphu, respectively.

Additionally, the Royal Commission for Urban Development (RCUD) was established in 2021 to oversee urban planning, including implementing the Thimphu Structure Plan and the Thimphu-Paro Regional Strategy, while facilitating inter-agency coordination. Its mission is to reduce climate change vulnerabilities, protect culturally and environmentally sensitive areas, promote sustainable and resilient development, and enhance institutional collaboration.

RCUD envisioned this project to bring about institutional changes in the coordination and implementation of projects in urban areas. The project will help RCUD make informed decisions by identifying gaps and challenges in mainstreaming participatory urban development, including future resource mobilization.

The government is currently in the process of establishing a green financing system, which will incorporate innovative financing solutions for nature-based approaches, in a broader sense. The Royal Monetary Authority (RMA) is spearheading the development of Bhutan's green financing roadmap and taxonomy, while the Ministry of Finance is exploring diverse

financing options including domestic financing, green bonds, and sovereign bonds. Additionally, the establishment of new national entities for climate finance, like the Bhutan Climate Fund which was launched at COP28 in November 2023. Since 2016, Bhutan has been implementing BIOFIN, introducing four biodiversity finance solutions to protect and restore nature, bridge resource gaps, and stimulate economic growth. Within the UNDP/GEF Advancing Climate Resilience of the Water Sector in Bhutan (ACREWAS) project, Bhutan is replicating and upscaling payment for ecosystem services (PES) scheme as part of water and rural development efforts, focusing on districts beyond Thimphu and Paro.

Furthermore, the government initiatives are currently in progress to incorporate climate change education into the existing education system. The Royal University of Bhutan (RUB) regularly updates its study programmes, with a specific focus on integrating modules related to climate change and urban resilience. The College of Science and Technology (CST) includes environmental science, sustainability, and disaster management in the curricula of Civil Engineering and Architecture programmes, while the Water Resource Engineering programme currently incorporates 30% climate change-related content. The CST has a research centre for Disaster Risk Reduction and Community Development Studies in Bhutan, with the aim to create awareness and adequate expertise in various disciplines of disaster risk reduction and community development studies. The College of Natural Resources (CNR) offers various study programmes in environmental and climate science. Fostering collaboration between the CNR and the CST is crucial to ensure interdisciplinary education. Moreover, the World Bank's 'Strengthening Risk Information for Disaster Resilience in Bhutan' project includes an education and capacity building component for stakeholders in the construction and built environment sectors, laying the groundwork for continuous learning within the industry.

The UNEP's multi-country GEF-funded program 'Building Climate Resilience of Urban Systems through Ecosystem-based Adaptation in the Asia-Pacific' has facilitated regional knowledge exchange and supported the restoration and stabilization of a 1.5 km stretch along the Wangchu River. Similarly, ADB's 2022 project "Water Flagship Program support project" amounting to USD 22 M (including government and JICA co-financing) aims to strengthen water security in the Thimphu until 2030. More importantly, this project invests in the integration of SCADA (Supervisory Control and Data Acquisition) and smart devices to monitor hydrological information. In addition, the World Bank's project "Strengthening Risk Information for Disaster Resilience in Bhutan" will invest USD 3.51 M until 2025 to establish multi-hazard risk decision-making systems and strengthening hydrometeorological services delivery. This project also invested USD 300,000 in capacity building for built environment and construction stakeholders in Bhutan to enhance knowledge and lay the foundations for mainstreaming resilient and green infrastructure.

## Barriers



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## **Inadequate planning and design, decision making and monitoring that are not gender responsive, inclusive and climate-risk informed**

The current approaches and strategies of urban planning and development are not adequate in addressing the complex challenges of climate change. The design, decision-making processes, and monitoring efforts are not comprehensively informed by climate-risk considerations and vulnerabilities, resulting in increased exposure to risks and potential threat to the community (maladaptation). Moreover, planning and design of urban spaces and services does not consider nature based solutions/approaches, nor consider the specific needs and priorities based on gender, (dis)abilities, economic status and age. Therefore, there is inadequate risk-informed planning and design, decision making and monitoring in urban planning and development.

### **Limited technical capacity on climate resilient urban planning and governance**

The agencies and institutions responsible for urban planning, development and governance have limited expertise and institutional capacity to effectively address climate resilience challenges. The planners, engineers and other relevant professionals involved in urban planning and development have limited technical skills and capacities to understand and assess the impact of climate change and integrate nature-based solutions and climate resilience into urban planning, design and development processes. Apart from limited experience integrating nature-based approaches in urban planning, they also lack adequate capacities to identify and integrate specific needs of women, persons with disabilities and other vulnerable groups in urban development. This has resulted in inadequate response to climate induced hazards and vulnerabilities limiting the ability to adapt to climate related disruptions.

### **Lack of financing solutions for public authorities, investors, and communities to invest in resilient infrastructure and livelihoods**

The conventional sources of government budgets are insufficient to meet the growing urgency for resilient infrastructure and livelihoods. Due to limited financial instruments/mechanisms in government agencies and private sectors, there remains the challenge to secure, mobilize, and allocate necessary funds for investments in resilience-building initiatives. In absence of innovative financing solutions, the public institutions, investors and communities struggle to access funding and resources to implement resilience-building measures. Thus, scaling-up public and private investment in green infrastructure, disaster preparedness, ecosystem restoration, and livelihood diversification initiatives are limited.

### **Absence of technologies, services, and products necessary for contextual climate resilient urban development**

There is a lack of innovative tools, techniques and technologies that are tailored to the specific context and challenges faced by Thimphu-Paro region in dealing with climate change impacts. The absence of local expertise, services, awareness on green infrastructure and

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**digital solutions needed to support climate-resilient urban development are hampering the implementation of resilience-building initiatives.**

**Inadequate climate resilient urban infrastructure and solutions to prevent flooding, and conserve and enhance water sources**

**The existing infrastructure systems are susceptible to failure, damage, and disruption due to their exposure to extreme weather events and other climate induced hazards, adversely impacting vulnerable people. The built environment and physical assets including drainage systems, water supply networks, and buildings are not designed and constructed to withstand the evolving climate conditions such as heavy and incessant rainfall events. Flooding poses a significant risk for Thimphu and Paro urban areas. The existing infrastructure lacks sufficient flood protection measures in the river basins and the urban drainage systems/stormwater management facilities.**

**Low level of awareness on nature-based solutions, and ownership and responsibility over public spaces**

**The communities have limited awareness on integration of nature-based solutions in private infrastructure to enhance resilience. There is a low level of ownership over the public infrastructure, as well as minimal participation in maintaining and improving these public goods and services.**

## **Proposed approach**

**The recently adopted NAP<sup>[49]</sup> prioritizes nature-based solutions, specifically, its application in the water and human settlements sectors. While there is a clear strategic emphasis on safeguarding Bhutan's urban regions from floods and landslides and adopting nature-based climate adaptation approaches, these efforts are in the nascent stage and still evolving. Several projects address aspects of climate resilience in Bhutan, but with limitations. Examples include the UNDP -GEF project ACREWAS's focus on rural water management, UNEP's pilot river restoration project, and disaster risk initiatives by JICA and the World Bank. On the other hand, previous investments by the RGoB in safeguarding riverbanks and urban planning to mitigate landslides and floods have not adequately addressed the impacts of climate change and the heightened flood risk during the monsoon season. The ECRUL project seeks to bridge these gaps, scaling up efforts in urban areas with a focus on disaster preparedness, integrated planning, and Nature-based Solutions (NbS).**

**The objective of ECRUL project is to strengthen the management of climate risks and reduce the vulnerability of urban landscapes and communities to the impacts of climate change in**



the Thimphu-Paro region, which is strongly build on the RCUD's mandate to enhance Thimphu and Paro's resilience to water-related climate change impacts (flooding and droughts) and improve the integration of nature-based approaches in planning to deliver economic, social and environmental benefits to communities in both cities in a gender inclusive manner. This will be achieved through an integrated approach to engagement of vulnerable people, improved coordination, capacities, policies and tools of central and local governments for gender and climate-responsive urban planning and design, delivering transformational change for 25% of the country's population, covering 40% of the country's GDP, and 46% of the urban population. This approach to scaling will result in durable climate resilient integrating nature-based principles, enhancing disaster preparedness and response, and strengthening adaptive capacity of local community households and businesses through tailored training and awareness raising. Through the focused activities in the Thimphu-Paro region, and the communication of lessons learnt, urban resilience will be improved across the country, and beyond.

The project is comprised of three complementary components which will directly benefit 146,298 residents (accounting for 46% of the urban population) in the Thimphu -Paro region (75,211 M/71,087 F), manage 800 hectares of urban area through nature-based solutions to address climate induced risk and stresses to water resources and management of infrastructures. Additionally, the project aims to improve capacities of local governments, national agencies, CSOs and private sectors to improve resilient urban development and enhance adaptive capacities of vulnerable communities. It will facilitate the development of long-term climate risk mitigation through geospatial, climate data modelling, and gender-disaggregated data collection and management. Enterprises and markets will be developed around climate resilient technologies promoting green jobs.

The root causes of the problem are from climate induced hazards combined with Bhutan's unique topographical characteristics of high elevations and rugged terrain. This has and will continue to result in climate induced floods and landslides due to increased temperatures causing glacier melt compounded by intense rainfall, especially during the monsoon season. The impact of these hazards is exacerbated by the concretisation of urban areas leading to clogging of drainage and sewerage systems resulting in higher surface water run-off in these urban areas. Streams and rivers swell and carry debris from both the surrounding forests and urban waste, straining the city's limited infrastructure to manage runoff. Consequently, these events damage assets and livelihoods, with women and other vulnerable groups experiencing a disproportionate burden.

The climate change problems include extreme heat leading to reduced water availability as a result of drying water sources, catchment degradation and reduced water recharge capacities impeding sustainable access to potable water and reduced water retention for ecosystems. The changes in precipitation patterns and extreme rain patterns/events damage urban infrastructure, create water shortages, reduce water quality, resulting in economic losses, and increased risk to human life and safety.

To address the barriers identified in the previous section, the project will develop targeted institutional and local capacity building on climate hazards, adaptive urban planning, new technologies to incorporate data analytics, NbS and innovative financing mechanisms. This knowledge will be applied to develop technologically risk-informed, and gender responsive urban planning. The project will address inter-agency and multi-sectoral collaboration needs to strengthen and increase coherence of national and local policies for climate resilient planning, including water and stormwater management, adaptation initiatives and Early Warning System (EWS).

The project strategy includes utilising green infrastructure and NbS to address climate hazards, which aligns with Bhutan's national strategies, GEF focal area outcomes, and LDCF objectives. Innovative financing solutions such as Public-Private Partnership (PPP), Payment for Ecosystem Services (PES) will be implemented with the aim to replicate and scale up to ensure financial sustainability. Similarly, NbS incubators and incentives for community-based entrepreneurs' investment in NbS, will ensure sustainability of such initiatives.

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## B. PROJECT DESCRIPTION

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the guidance document. (Approximately 3-5 pages) see guidance here

## **Theory of Change**

**The objective of this project is to strengthen the management of climate risks and reduce the vulnerability of urban landscapes and communities to the impacts of climate change in the Thimphu-Paro region.**

**The Theory of Change for the project is summarised as follows:**

**The Theory of Change for the project is that IF an integrated approach of improved coordination, capacities and tools combined with strategic tangible interventions in key sectors are provided, and communicated THEN the households, businesses and local government entities in the Thimphu-Paro region will become more resilient to climate-induced urban risks BECAUSE the urban areas are better able to adapt to climate change and mitigate climate-induced risks in the future. The diagram of the Theory of Change is given on the next page.**

### **Root causes**

**The root causes of the problem are from climate induced hazards combined with Bhutan's unique topographical characteristics of high elevations and rugged terrain. This has and will continue to result in climate induced floods and landslides due to increased temperatures causing glacier melt compounded by intense rainfall, especially during the monsoon season. The impact of these hazards is exacerbated by the concretisation of urban areas leading to clogging of drainage and sewerage systems resulting in higher surface water run-off in these urban areas. Streams and rivers swell and carry debris from both the surrounding forests and urban waste, straining the city's limited infrastructure to manage runoff. Consequently, these events damage assets and livelihoods, with women and other vulnerable groups experiencing a disproportionate burden.**

### **Problem**

**The climate change problems include extreme heat leading to reduced water availability as a result of drying water sources, catchment degradation and reduced water recharge capacities impeding sustainable access to potable water and reduced water retention for ecosystems. The changes in precipitation patterns and extreme rain patterns/events damage urban infrastructure, create water shortages, reduce water quality, resulting in economic losses, and increased risk to human life and safety. Additionally, lack of nature-based approaches to planning reduces permeable surfaces as Bhutan's cities rapidly urbanise, increasing the risk of flash flooding and landslides.**

### **Addressing barriers**

To address aforementioned barriers, the project will develop targeted institutional and local capacity building on climate hazards, adaptive urban planning, new technologies to incorporate data analytics, NbS and innovative financing mechanisms. This knowledge will be applied to develop technologically risk-informed, and gender responsive urban planning. The project will address inter-agency and multi-sectoral collaboration needs to strengthen and increase coherence of national and local policies for climate resilient planning, including water and stormwater management, adaptation initiatives and Early Warning System (EWS).

### **Project strategy & components**

The project strategy includes utilising green infrastructure and NbS to address climate hazards, which aligns with Bhutan's national strategies, GEF focal area outcomes, and LDCF objectives. NbS, in contrast to gray infrastructure, utilizes natural processes to mitigate the impact of climate change and alleviate pressure on local infrastructure. Considering the measures outlined in the regional development plan and structure plans for Thimphu and Paro, as well as the analysis of suitable NbS for mountainous cities, and incorporating lessons learned from consultations with national and local stakeholders, the project will implement various on-the-ground interventions. These include enhancing riverbanks, rehabilitating riverine forests, constructing retention basins and bioswales, restoring watersheds, replanting trees to stabilize landslides, introducing green roofs and walls, and other.

The project directly contributes to UNSDCF outcome 3 and UNDP CPD outcome 2: "By 2028, Bhutan's environment remains sustainably managed, and its people are more resilient to disaster risks and climate change".

The project is comprised of three complementary components which will directly benefit 146,298 residents (accounting for 46% of the urban population) in the Thimphu -Paro region (75,211 M/71,087 F), manage 800 hectares of urban area through nature-based solutions to address climate induced risk and stresses to water resources and management of infrastructures. Additionally, the project aims to improve capacities of local governments, national agencies, CSOs and private sectors to improve resilient urban development and enhance adaptive capacities of vulnerable communities. It will facilitate the development of long-term climate risk management and adaptation through geospatial, climate data modelling, and gender-disaggregated data collection and management. Enterprises and markets will be developed around climate resilient technologies promoting green jobs.

Innovative financing solutions such as Public-Private Partnership (PPP), Payment for Ecosystem Services (PES) will be implemented with the aim to replicate and scale up to ensure financial sustainability. Similarly, NbS accelerators and incentives for community-based entrepreneurs' investment in NbS, will ensure sustainability of such initiatives. Private sector partners, including entrepreneurs, the Bhutan Chamber of Commerce and Industry (BCCI) as an umbrella organisation , as well as the central bank, financial institutions,



micro-financiers, and insurance companies, were involved in the project design and are expected to play a significant role in its implementation.

The project activities related to developing plans and designs including the construction of climate resilient infrastructures will be led and implemented by the private sector. Further, under Output 1.5 a localized strategy for private sector involvement in NbS implementation will be developed to have further clarity on the specific opportunities as an implementer. In particular, the project will support entrepreneurship programs related to NbS, to create an avenue for establishing new businesses as well as accelerating the existing businesses. The entrepreneurs will be linked to the financing mechanism like Economic Stimulus Plan to ease access to finance, skills and technologies. In order to link to the market as well as create a platform to demonstrate NbS and resilient technologies, the project will support symposiums and trade shows that can open up demand for scale up.

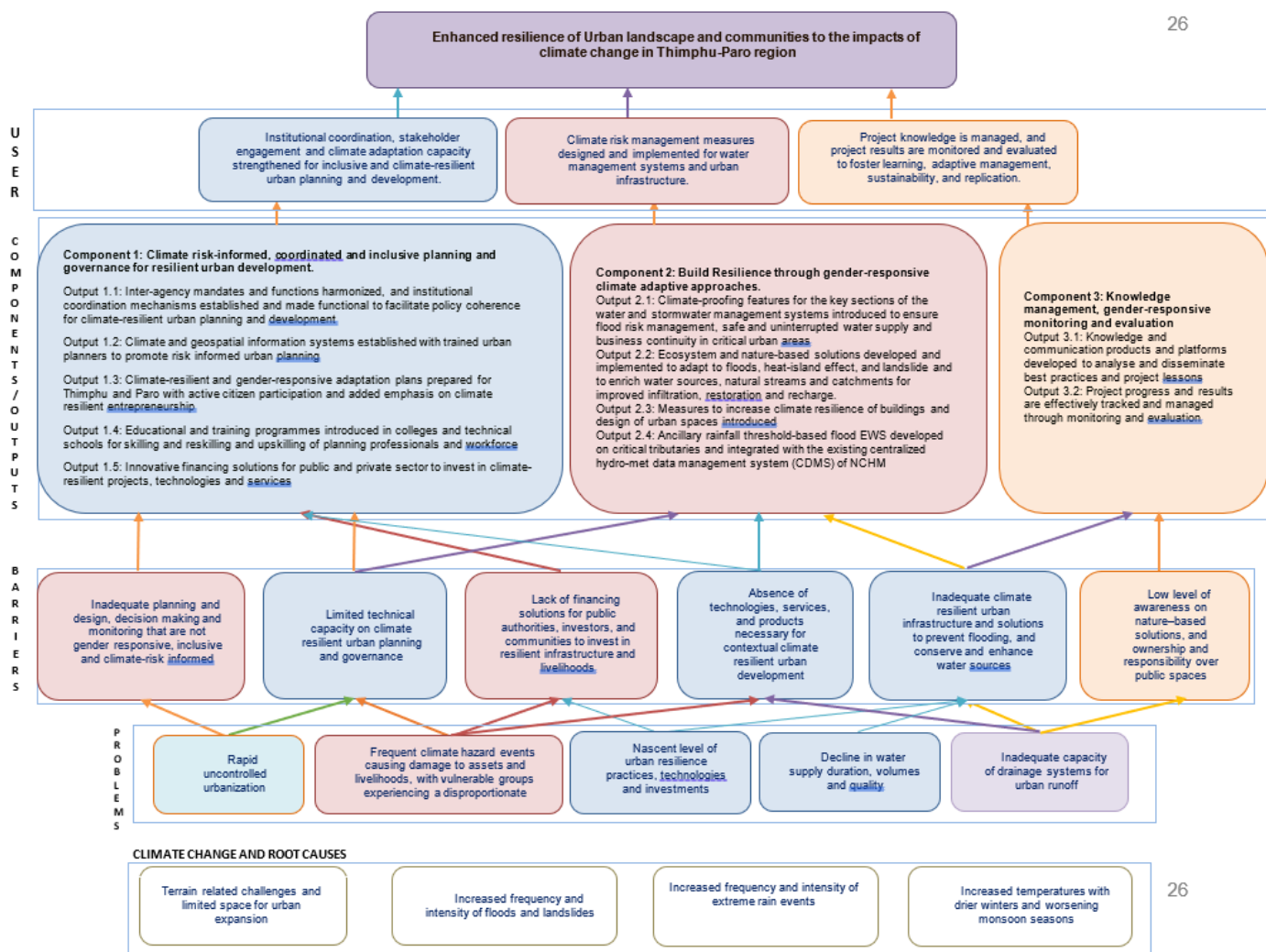
The project design incorporates scenario planning as part of the project preparation and design for any physical intervention, which allows to anticipate and prepare for future changes in social and economic drivers. This approach further is supported by technical training and GIS modelling software, providing tools for analysing these shifts. A key focus of the project is the implementation of Nature-based Solutions (NbS) and ecosystem-based approaches, which are inherently resilient to the impacts of climate change.

An adaptive management approach with regular feedback loops allows for continuous learning and project adjustments. In addition, wide stakeholder engagement ensures that diverse perspectives are included, fostering resilience and support for adaptive measures.

The risks identified during the project design will be monitored and updated regularly. Such measures will support in identifying possible risks posed and come up with appropriate measures to either avoid or mitigate the impacts.

### **Approach to scaling up**

Scaling will be achieved through an integrated approach to engagement of vulnerable people, improved coordination, capacities, policies and tools of central and local governments for gender and climate-responsive urban planning and design, along with tangible investments and knowledge sharing, delivering transformational change for 25% of the country's population, covering 40% of the country's GDP, and 46% of the urban population. This approach to scaling will result in durable climate resilient infrastructure solutions integrating nature-based principles, enhancing disaster preparedness and response, and strengthening adaptive capacity of local community households and businesses through tailored training and awareness raising. Through the focused activities in the Thimphu-Paro region, and the communication of lessons learnt, urban resilience will be improved across the country, and beyond.



The objective of the project is to strengthen the management of climate risks and reduce the vulnerability of urban landscapes and communities to the impacts of climate change in Thimphu-Paro. The project will directly enhance the climate resilience of 146,298 people (48.9% women) in urban landscapes and the adaptive capacities of the population of Thimphu and Paro region by strengthening climate risk management and supporting adaptation interventions for enhanced resilience of urban areas in Bhutan. The project will address various climate related challenges, including riverine and surface water flooding,



**water stress, landslides, forest fires, cyclonic events and others, by effectively managing watershed and springshed, enhancing river corridors through urban forestry techniques, developing retention ponds, rain gardens, and urban wetlands, as well as rehabilitation of stormwater drainage networks in Thimphu and Paro. Furthermore, the project will demonstrate inclusive and climate resilient building technology in Thimphu, propose revising green building standards and design tools. Based on the future climate projections and barriers, the project will guide enhanced disaster preparedness, knowledge, capacity and competency skills across communities and businesses, for the two major cities of Thimphu and Paro. Through outcome 3 knowledge will be collected and communicated to other parts of Bhutan and globally to foster upscaling and replication.**

**The project seeks to advance climate risk informed urban planning through three complementary Outcomes:**

- Outcome 1: Institutional coordination, stakeholder engagement and climate adaptation capacity strengthened for inclusive and-resilient urban planning and development; Under this outcome the project will drive a transformative shift towards integrated, coordinated, climate-resilient urban planning and development. It will use technology, risk assessment data, and a focus on inclusivity to guide decision-making. New digital systems and climate data will streamline urban planning, ensuring a focus on innovation and proactive risk management. The project also establishes governance frameworks and fosters collaboration across levels to ensure unified, climate-resilient planning within cities and communities. The project will identify, design, and implement innovative financing solutions, such as PPP, PES, climate bonds, as well as both fiscal and non-fiscal incentives to promote private sector investment and incentivise, and support community-based entrepreneurs**

engaged in nature-based, small-scale income generation and livelihood diversification activities.

- **Outcome 2:** Climate risk management measures designed and implemented for water management systems and urban infrastructure; Building on the engagement and coordination of outcome 1, this outcome will strongly promote infrastructure based on NbS to complement grey infrastructure to enhance the resilience of water and stormwater management systems. It will protect water resources, implement green building practices, and provide climate information for informed decision-making through deployment of innovative technologies like GIS, IoT, and SCADA for data analysis. Also, it will enhance the existing EWS for proactive hazard response. This outcome focuses on climate-proofing critical infrastructure with NbS and ensuring community safety through advanced technologies and climate data access.
- **Outcome 3:** Project knowledge is managed, and project results are monitored and evaluated to foster learning, adaptive management, sustainability and replication. Knowledge generated through outcomes 1 and 2 will be collected and disseminated in outcome 3. This will allow for replication in other cities in Bhutan and beyond.

Particularly in relation to Component 2 related on-the-ground activities the project will have a social and environmental safeguard focus. Where for instance, site-specific Social and Environmental Screening will be conducted using the UNDP screening tool to identify potential risk areas related to the project sites, specifically as well as the immediate surroundings. These identified risks will be integrated into the call for proposals for project design or construction / implementation. Additionally, prospective contractors must outline their company's strategy for managing and mitigating these risks as part of their offer. This entails incorporating risk management into their bid's scope of work, which will be a key criterion for bid selection. Throughout the contract's execution, the contractor will be responsible for monitoring and adequately address the identified environmental and social risks.

In summary, the project will drive a transformation in urban planning and innovate financing by adopting a holistic approach that integrates climate risks. This will be achieved by streamlining existing policies, plans, and mandates of relevant agencies and developing systems and data for downscaled climate risk analysis. Additionally, comprehensive capacity building will be implemented for all current and future experts, technicians, and workers involved in urban resilience, including planners. The project also promotes NbS entrepreneurship by supporting the creation of new NbS projects and encouraging private

sector investment. Furthermore, it explores innovative financial mechanisms aligned with ongoing green financing initiatives.

## **Component 1: Climate risk-informed, coordinated and inclusive planning and governance for resilient urban development**

### **Outcome 1: Institutional coordination, stakeholder engagement and climate adaptation capacity strengthened for inclusive and resilient urban planning and development**

***Total budget: GEF-LDCF: \$ 4,490,000; Co-financing: \$ 16,450,000)***

#### **Baseline scenario**

The current institutional framework lacks clarity in terms of mandates and coordination among key actors, therefore, hindering climateresilient urban planning. Despite the establishment of the Royal Commission for Urban Development, which was established to develop the Thimphu-Paro Regional Strategy (TPRS) and Thimphu Structure Plan (TSP) for a 3-year period, until October 2024, and its focus on an integrated approach to urban planning, the challenge of inadequate institutional and technical capacity persists. Traditional knowledge exists, but there is limited integration of NbS, as opposed to investments in grey infrastructure. Climate change education initiatives are ongoing, but students and professionals lack exposure to NbS and inclusive climate-informed decision-making. Limited market initiatives, budget constraints, and capacity gaps both in public and private sectors further impede NbS adoption. In terms of Adaptation planning, the country is governed by the overall National Adaptation Plan (NAP), with the potential to trickle down the NAP into the local level adaptation programming.

#### **With LDCF financed intervention**

The project envisions a transformative shift from the currently fragmented approach to a well-coordinated and climate resilient urban design for an inclusive and institutionally integrated model. The initiative underscores importance of incorporating climate and geospatial information, harnessing technology, and gender-disaggregated data to assess and

prioritize risk-informed decision-making and adaptation planning in coherent and coordinated approaches. This will be facilitated by enhancing current technology as well as equipping new digital systems for green building tool, GIS, EWS, and SCADA. The project will generate climate data and information and ensure accessibility across sectors for future urban planning decisions, promoting innovation, and ensuring a proactive approach for risk-informed planning and execution in a coordinated manner (Output 1.2).

The project will conduct a gap analysis to assess Bhutan's national and local urban planning arrangements in terms of gender responsiveness and climate resilience, and based on these findings, develop a participatory strategy and operative framework to enhance coordination and governance structures for climate-resilient urban planning. By establishing clear roles and responsibilities, the project fosters collaboration between national and local levels as well as across sectors, thereby enhancing coordinated mechanisms, and supporting policy coherence and increased accountability (Output 1.1). The project aims to broaden the scope of adaptation discussions from the national level to encompass local-levels adaptive planning. This includes advocating for the development of municipal climate change plans and empowering cities and urban communities through a multi-level governance approach (Output 1.3). The initiative is structured to integrate innovative, participative and climate-responsive considerations into urban planning policies, creating a unified framework. The project design will also prioritise gender-responsive and inclusive adaptation measures, universal access to infrastructure, services and capacity building and in generally addressing the distinct vulnerabilities of different groups.

The project places a strong emphasis on collaborative design and extensive community engagement, including women, youth, elderly, persons with disabilities, in accordance with relevant guidelines such as the Stakeholder Engagement Plan (SEP - Annex 8) and Gender Analysis and Action Plan (GAAP - Annex 10). This participatory approach, complemented by training in climate adaptive urban planning, aims to introduce and institutionalize climate adaptation capacity including NbS knowledge (Output 1.4). These initiatives are used as a method to adapt to challenges such as the heat island effect, floods, landslides, and water stress. To ensure sustainability, the project will identify, design, and implement innovative financing solutions, including both fiscal and non-fiscal incentives to promote private sector investment in commercially viable green, gender responsive and climate resilient projects, technologies and services (Output 1.5). Also, the project will develop and implement localized strategies for involvement of investors and entrepreneurs to promote NbS. Activities such as upskilling, accelerator program and localised support mechanism for NbS will be prioritised for the entrepreneurial ecosystem.

## **Innovative Financing**

The project will identify, design, and implement innovative financing solutions, including both fiscal and non-fiscal incentives to promote private sector investment in commercially viable green, gender responsive and climate resilient projects, technologies and services. The private sector will be involved ensuring the sustainability of the project interventions through PPP for long term financing and sustainable project management and utilizing PES as an innovative financing mechanism for urban resilience initiatives.

Simultaneously, the project will incentivize, and support community-based entrepreneurs engaged in nature-based, small-scale income generation and livelihood diversification activities. In the area of water management, the project will assess and enhance the tariff collection system by leveraging innovative applications of ICT and IoT. Additionally, the project aims to catalyse entrepreneurship in green and resilient construction for urban resilience with particular attention on engaging women, youth, and other vulnerable groups, ensuring inclusive participation in the economic aspects.

***Output 1.1: Inter-agency mandates and functions harmonized, and institutional coordination mechanisms established and made functional to facilitate policy coherence for climate-resilient urban planning and development***

### ***Key results***

- **Improved inter-agency coordination and policy coherence for climate-resilient urban development**

The Strategy and Operational Framework developed through this output will be formalized by the Ministry of Infrastructure and Transport. The RCUD will function as an advisory body looking after the whole country and will ensure inter agencies and mandates are harmonized and enhance the institutional coordination mechanism. The identified measures will be

institutionalized during the project's implementation and adopted by relevant authorities at the national, district, and local levels, depending on the nature of the respective solution.

Similarly, as RCUD has mandates to oversee plans and urban development for the entire country, the lessons learned and best practices from the ECRUL project will be shared and replicated in other urban areas of Bhutan as outlined in component 3 of this project.

In order to institutionalize at the national level, the Royal Commission for Urban Development (RCUD) as the apex body will provide strategic guidance while formulating policies and strategies and streamlining the institutional coordination aimed at advancing urban planning and development in Bhutan. The RCUD will facilitate the implementation of the Thimphu Structure Plan, overseeing the Thimphu Paro Regional strategy and facilitating inter-agency coordination in matters pertaining to urban planning and resilience.

At the implementational level, the project will be guided by the following institutional arrangements to build complementarities:

- I. Security Cluster of the 13th FYP
- II. Climate Change and Disaster Resilience results group of the United Nations Sustainable Development Cooperation Framework (UNSDCF) chaired by Director, DECC, MoENR and Co-chaired by WFP Country Director.
- III. Project Board at the project level.

#	Activity / Sub-activity	Year
1.1.1	<b>Developing strategy and operative framework for inter-agency coordination and policy coherence for climate-resilient urban planning and development, in a participatory manner.</b>	1
1.1.1.1	Assessment of existing national, district and municipal institutional arrangements, mandates and functions in the context of gender-responsive and climate-resilient urban development. This will be followed by: a) a review of how these arrangements are functioning and b) an analysis of gaps, inconsistencies, and overlaps, all in view of gender-responsive and climate resilient urban development, c) validation of findings with institutions to integrate NbS into climate resilient urban planning strategies	1
1.1.1.2	Development of Strategy and Operational Framework for streamlined inter-agency coordination and improved policy coherence, in participatory manner	1
1.1.1.3	Endorsement and operationalization of Strategy and Operational Framework	1

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***Output 1.2: Climate and geospatial information systems established with trained urban planners to promote risk informed urban planning***

***Key results***

- **Enhanced GIS system with downscaled vulnerability and climate risk data**
- **GIS officers and users trained**

Under this output, the project will support the design and implementation of a comprehensive climate and geospatial information system generating sex-disaggregated data, made accessible to central and local government, and other relevant agencies for informed decision-making. The current GIS system, used by the Geomatics and Logistics Division from the Ministry of Infrastructure and Transport (MoIT), will be analysed to identify necessary software and hardware upgrades. Furthermore, the project will identify downscaled climate-related and vulnerability information gaps and produce required datasets and maps. The system will allow for the analysis and visualization of various climate variables across different spatial and temporal scales, which will enable climate-risk informed land use planning, infrastructure and building design, natural resource management, disaster risk reduction and relief plans.

The aim of this system is to centralise spatial data such as road, utilities and climate data to improve decision making and enable other systems to be integrated with it/built upon it. This will have a long-term impact on efficiency of implementing future projects. Additionally, the aim is to display data and maps on the platform, enabling other relevant agencies to access them for analysis rather than restricting their use to only one individual or agency, thus improving inter-agency cooperation and collaboration. A GIS system would enable central and local governments to access a range of spatial and climatic data, including rainfall, soil moisture levels, and flood-prone areas. The GIS system would enable central and local governments to access different spatial data and generate insights when making decisions.



Additionally, an operation and management manual for the GIS system, with established protocols, procedures and troubleshooting guideline, will be created, and capacity building and user training will be conducted for climate-resilient, gender-responsive urban planning and design.

The activities under this output will foster synergy with the National Land Commission and other partners to ensure long-term sustainability. Although the ongoing project, “Promotion of Utilization of Geospatial Information through Development of National Spatial Data Infrastructure (NSDI),” offers a repository for all spatial (GIS) data, it may not prioritize downscaled, local-level climate-related data. These datasets will be linked to the NSDI system, and their full integration will be carried out during the course of the project,

#	Activity / Sub-activity	Year
<b>1.2.1</b>	<b>Assessment of existing GIS systems / identification of gaps in the current management of relevant data, especially relating to downscaled vulnerability data and climate impacts and hazard maps.</b>	<b>1-3</b>
1.2.1.1	Analysis of existing GIS system (usage, datasets), including identification of climate and vulnerability related information gaps	1-3
1.2.1.2	Assessment of current hardware and software functionalities with the identification of necessary upgrades	1-3
<b>1.2.2</b>	<b>Enhancement and integration of multi-dimensional climate and geospatial information system and provision of other computerized tools to ensure consistent and reliable single data source supporting gender-responsive and climate-resilient urban planning and development.</b>	<b>2-4</b>
1.2.2.1	Customisation or enhancement of the existing systems for hosting the products (maps, charts, information etc) of this project	2-4
1.2.2.2	Procurement and installation of hardware and software for multi-dimensional climate GIS system	2-4
1.2.2.3	Data Analysis for producing maps and information: 1) through internal analysis in the Geomatics and Logistics Division of MoIT 2) through procurement (if needed)	2-4
<b>1.2.3</b>	<b>Develop operation and management manual for the GIS system and carry out training for GIS officers and other professionals to use GIS for climate and urban resilience purpose.</b>	<b>1-5</b>
1.2.3.1	Development of operation and management manual for GIS system	1-5
1.2.3.2	Implementation of capacity building for GIS Officers and other professionals working in the application of GIS in Climate and Urban Resilience	1-5
1.2.3.3	Capacity building of the relevant officials on the application of GIS for water supply systems in Thimphu and Paro	1-5



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***Output 1.3: Climate-resilient and gender-responsive adaptation plans prepared for Thimphu and Paro with active citizen participation and added emphasis on climate resilient entrepreneurship***

***Key results***

- Gender-responsive adaptation plans for Thimphu and Paro developed
- Localised entrepreneurship support mechanisms deployed
- Entrepreneurs participating in implementation of adaptation actions
- New NbS initiatives launched via NbS accelerator programme
- Community level NbS plans prepared

Within this component, the project will assist Thimphu and Paro municipalities in developing their comprehensive climate-resilient and gender-sensitive adaptation plans. These plans will be developed under the guidance of the Department of Energy and Climate Change, a division of the Ministry of Natural Resources and Energy responsible for implementing the National Adaptation Plan, in collaboration with Thimphu and Paro municipalities, who will later oversee their implementation. The Thimphu-Paro regional strategy document is a strategic document that outlines the spatial framework for the formulation of Thimphu Structure Plan (TSP) and Paro Valley Development Plan (PVDP). While most of the areas under Thimphu Structure Plan have Local Area Plans (LAP) in place, PVDP has identified a total of 27 LAPs wherein there is a tremendous potential for integration of NBS solution and climate resilient interventions. The ECRUL project will integrate NBS while formulating adaptation plans for Thimphu and Paro anchoring onto the TSP and PVDP and LAPs. The learnings from these initiatives will be scaled up for the rest of the identified Local Area Plans.

The formulation of these local adaptation plans will be informed by thorough socio-economic analysis and climate risk and vulnerability assessments (RVA), supported by data from the climate and geospatial information systems established in Output 1.2. The plans will encompass various actions, including physical interventions centered on NbS, as well as improved practices, policy development, and capacity building.

Additionally, as the project adopts a multi-level governance approach, communities will be empowered to develop their own NbS plans, with a specific emphasis on the role of women, youth, and vulnerable populations. Community plans provide the flexibility for communities to decide on their actions, which can then be collaboratively designed and implemented. According to the Thimphu Paro Regional Strategy, the Thimphu Structural Plan, and the Paro Valley Plan, NbS is required 'to any extent.' Considering the level of urbanization in these two cities, it is necessary to incorporate small green areas at both the neighbourhood and building levels. NbS at this scale include allotments, pollination gardens, recreational parks, Sustainable Urban Drainage Systems (SUDS), green roofs, greening of vacant lots and roadsides, etc.

These plans will be targeting the neighbourhood level, marking their introduction for the first time in Bhutan. Municipalities and CSOs will lead this process, which will provide a framework for encouraging citizen involvement and ownership, fostering a sense of community through the development of small-scale NbS interventions. For that purpose, the PMU will be training officials working in Thimphu and Paro municipalities, on the integration of climate risks and impacts identified in local adaptation plans, as well as on understanding the effects of climate change on vulnerable communities and including gender issues in NbS.

The entrepreneurship program will include training, providing incubation spaces, organizing networking and promotional events, offering facilitation and support to new start-ups, acceleration support and other targeted programs. This approach aims to encourage individuals to pursue entrepreneurship, nurture their ideas through various initiatives, and support their growth once launched commercially. Throughout the process, we focus on fostering creativity, innovation, and a culture of entrepreneurship in the country. Support has been diverse, targeting various stages and often focusing on specific themes such as social, agriculture, production, Tech, and services.

Through this project, we will center on a Nature-based Solutions (NbS) theme, thereby promoting green entrepreneurship. The goal is to build a pool of green entrepreneurs and support existing NbS entrepreneurs. This project will establish a robust and unprecedented approach to developing green entrepreneurs through coordinated efforts among the stakeholders and focused investments.

To ensure effectiveness and efficiency, an Entrepreneurship Promotion Strategy will be developed to guide implementation. This is building up on similar entrepreneurship programs like [springboard](#) program, Basic [entrepreneurship](#) training, ToT on acceleration program, ToT on new [business](#) creation, Business Development Services, mentoring and coaching to the startups, different promotional [events services](#) and space through the Startup centers and Business [Incubation Units](#) managed by the Ministry of Industry, Commerce and Employment. The interventions including the cost and funding modalities were finalized based on the stakeholder consultation and experiences of managing such programs.

#	Activity / Sub-activity	Year
<b>1.3.1</b>	<b>Prepare climate-resilient and gender-responsive adaptation plans for Thimphu and Paro.</b>	<b>1-3</b>
1.3.1.1	Development of gender analysis and RVA as a basis for plans	1-3
1.3.1.2	Development of gender-responsive adaptation plans for Thimphu and Paro, in participatory manner	1-3
<b>1.3.2</b>	<b>Develop community NbS plans</b>	<b>1-4</b>
1.3.2.1	Gender responsive and inclusive community development plans for NbS	1-4
1.3.2.2	Capacity building of relevant officers on the risks and impacts of climate change on vulnerable communities and gender inclusion in NbS	1-4
<b>1.3.3</b>	<b>Support activities to stimulate entrepreneurship (including Social entrepreneurship such as women, youth, vulnerable group) in nature-based solutions, specifically in the context of implementation of gender-responsive adaptation plans for Thimphu and Paro.</b>	<b>1-5</b>
1.3.3.1	Development of localised strategy for involvement of private sector (investment and entrepreneurs) in implementation of NbS and other adaptation actions.	1-5
1.3.3.2	Upskilling of NbS entrepreneurship competencies for relevant officials	1-5
1.3.3.3	Enhancing NbS accelerator programme targeting community initiatives, youth, women, vulnerable populations, etc (including decision making opportunities)	1-5
1.3.3.4	Strengthening localised support mechanisms for scaling-up entrepreneurship in NbS and adaptation practices for Thimphu and Paro	1-5

**Output 1.4: Educational and training programmes introduced in colleges and technical schools for skilling, reskilling and upskilling of planning professionals and workforce**

### **Key results**

- Courses on climate resilience for students, planning and engineering professionals, technicians and construction workers developed, tested and evaluated

- Training and educational courses on climate resilience institutionalised
- 200 persons trained on climate resilience

This output seeks to mainstream climate resilience through educational and training programmes for urban planning professionals, engineers, technicians, and construction workers and investors. An analysis of past and ongoing educational and training programs will be conducted by Department of Workforce Planning and Skills Development under the Ministry of Education and Skills Development to identify areas for integration of content related to urban resilience. Building on the identified needs and gaps, and in collaboration with educational institutions within the country and abroad, the project will develop content to embed into existing or new modules, courses, or programmes. By leveraging synergies and new knowledge, the project will institutionalise a range of teaching and learning modalities that will also promote an inclusive learning environment. The MoIT will continue to extend technical support to the CST and other colleges while formulating the curriculum, training and evaluation.

Training of college and VTI students will be carried out as part of their study programme. Capacity building programs for technicians will be conducted by VTIs. Established professionals (not limited to planners and engineers) will be trained through the 'Training of Trainer' (ToT) model. Certain professionals will attend specialized courses offered by international forums and institutions. After, will then provide technical advice and inputs during the formulation of courses, as well as facilitate the effective transfer of skills and knowledge to a broader group of participants. Additionally, during project implementation, professionals and technicians will receive hands-on training through case simulations in a work environment. The project will offer both online and in-person training while implementing capacity-building programs. It will review and adopt best practices from WB or other projects for effective delivery.

All capacity building programmes will be evaluated to determine the effectiveness of courses, and appropriate remedial measures will be carried out to better meet the needs of students, professionals, technicians and workers, as well as the needs of the market. Overall, efforts will be made to establish long-term partnerships with educational institutions, to institutionalize climate resilience capacity development initiatives beyond the project's duration. The institutional program implementation is vital for fostering long-term capacity enhancement in Bhutan.

#	Activity / Sub-activity	Year
1.4.1	<b>Review of existing educational and training programs (technical training institutes, adults education, CSOs) and detailed needs assessment.</b>	1-3
1.4.1.1	Review of existing educational and training programmes and training capacity of training service providers in the government, civil society organizations and private sector, from a gender and climate adaptation perspective	1-3
1.4.2	<b>Design educational and training courses, including training content and modalities, and strengthen the capacity of relevant officials from learning institutions to host training programmes.</b>	1-5
1.4.2.1	Assessment of existing course and Development of courses based on the needs assessment	1-5
1.4.2.2	Strengthening the Capacity of relevant officials from learning institutions to be hosting training programs, including training of trainers	1-5
1.4.2.3	Implementation of courses in training institutes and colleges	1-5
1.4.3	<b>Implement training programmes for planning and engineering professionals, technicians, water and drainage/sanitation inspectors and construction workers.</b>	1-5
1.4.3.1	Capacity building for relevant officials in the planning and designing of nature-based stormwater and flood risk management	1-5
1.4.3.2	Conduct training and capacity development of officials of DoW and stakeholders on climate smart water resources management	1-5
1.4.3.3	Conduct training and capacity building of urban planners, landscape architects and engineers on urban planning and development using NBS	1-5
1.4.3.4	Capacity building of the relevant officials on the planning, design and construction of climate resilient water and wastewater infrastructures.	1-5
1.4.3.5	Capacity building of the technicians and site engineers on the Operation & Maintenance of Water and wastewater system	1-5
1.4.3.6	Capacity building on climate resilient green building technology for professionals (engineers and architects) and awareness for green building tool and standard	1-5
1.4.3.7	Training on the Forecast based EWS modelling and its integration into the existing flood forecasting system.	1-5
1.4.3.8	Training on weather (wrf) data downscaling and assimilation into flood forecasting system (EWS)	1-5
1.4.4	<b>Evaluate implemented educational and training programmes, and assess options for their institutionalisation to deliver permanent human capacity enhancement.</b>	2, 4
1.4.4.1	Evaluation of implemented programmes (tracer survey, attendance and performance, participants feedback, etc.)	2, 4
1.4.4.2	Assessment of options for permanent integration of training programmes in selected institutions	2, 4

## ***Output 1.5: Innovative financing solutions for public and private sector to invest in climate-resilient projects, technologies, and services***

### ***Key results***

- Climate change risks and measures integrated in fiscal planning
- Enhanced access to green financing for the private sector
- Strengthened capacity of financial institutions to absorb green financing
- PES and PPP schemes applied in the context of urban NbS

This output will introduce and experiment with innovative mechanisms for both public and private sector financing for climate-resilient projects and technologies. Existing public and private mechanisms were initially mapped during the preparation of this project (Annex 22 Financial Modality Survey ), but a more detailed analysis will be made during the project. Existing public and private mechanisms will be mapped and evaluated, including examining existing partnerships, funding, and regulations , while new mechanisms for the private sector involvement (e.g. in integrated watershed management or ecosystem restoration while embracing corporate social responsibility) will be showcased and adopted.

In this output, a special focus will be placed on the demonstration of PES and PPP mechanisms, i.e. their applicability to NbS in an urban context, which would be spearheaded by the Department of Water under the Ministry of Natural Resources and Environment for PES, and the Ministry of Finance for PPP. The PES scheme has been implemented in Bhutan, particularly in the districts of Tsirang and Mongar. Additionally, a new PES scheme is currently being established for the ACREWAS project. Additional financing options to explore include PES, PPP, taxation models, blended finance, crowdfunding, results-based budgeting through ecological transfers, and green bonds, which are some of the most promising alternatives for scaling up resilience-building efforts.

Additionally, the project will leverage the ongoing green taxonomy and sustainable financing framework by providing technical assistance to financial institutions. The technical assistance (TA) for financing institutions will target key areas identified as gaps during the Project Preparation Grant (PPG) stage, such as Introduction to Climate Stress Testing, Nature-based Solutions (NbS) Financing and Environmental and Social Risk Management (ESRM). The primary goal of this technical assistance is to strengthen the capacity of financial institutions to manage climate-related risks and to effectively identify and appraise NbS investments, particularly in urban settings.

Furthermore, the project will support the Climate Prosperity Plan, a strategy that will support Bhutan's vision of climate prosperity, development, resilience and carbon neutrality through an innovative policy landscape and sustainable financing. CPP will guide sectoral climate interventions and financing modalities, while prioritising urban resilience and nature-based solutions (amongst other sectors), that will subsequently boost investment



and socio-economic growth. Once the CPP is developed, it will guide in securing innovative climate finance such as carbon financing, green bonds, insurance for loss and damage, taxation, incentives for private sectors, etc to fund priority projects. Furthermore, this output will help integrate climate information into macro-fiscal projections. Currently, macro-economic projections do not account for climate change impacts, but the government is working to incorporate climate change into GDP projections, household productivity, public finance, the financial sector, and external accounts. Both aforementioned activities would be led by the Ministry of Finance with the Royal Monetary Authority.

The project will specifically help to integrate NbS, climate resilience components in line with NDCs (2.0 and 3.0), NAP and any national priorities in the CPP, which will nudge financing for NbS and urban resilience.

#	Activity / Sub-activity	Year
1.5.1	<b>Strengthening mechanisms for private and public climate finance</b>	1-3
1.5.1.1	Assessment and demonstration of mechanisms to strengthen private sector engagement for NbS and urban resilience projects through the formulation of private sector engagement strategy	1-3
1.5.1.2	Climate and early warning information with macro-economic projections to inform climate adaptation efforts within fiscal planning	1-3
1.5.1.3	Development of and capacitation on Climate Prosperity Plan (CPP) to strategize climate change related (NbS and Urban Resilience) innovative financing mechanisms	1-3
1.5.2	<b>Support to development of policy supporting incentive system and training for green financing for financial institutions.</b>	2-4
1.5.2.1	Assessment and development of policy supporting incentive system for green financing for financial institutions	2-4
1.5.2.2	Development and implementation of training package on Climate Stress Testing, NbS financing, Environmental and Social Risk Management (ESRM) for financial institutions	2-4
1.5.3	<b>Conduct feasibility assessment of various NbS financing models in Urban development</b>	2-6
1.5.3.1	Support implementation of NbS interventions for urban resilience under the enhanced PES scheme	2-6
1.5.3.2	Support assessment and implementation of NbS interventions for urban resilience under Green Taxonomy and Sustainable Financing Framework exploring the PPP model	2-6
1.5.3.3	Assessment on water tariff system in Paro and Thimphu to ensure financial sustainability and allocating a portion of tariffs towards NbS investments for improved water management	2-6



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## **Component 2: Build Resilience through gender-responsive climate adaptive approaches**

**Outcome 2: Climate risk management measures designed and implemented for water management systems and urban infrastructure**

**Total budget GEF-LDCF: \$ 11,599,000; Co-financing: \$ 36,655,000**

### **Baseline scenario**

Efforts to address climate change in the Thimphu-Paro urban region primarily rely on conventional grey infrastructure for urban planning and hazard mitigation, with limited adoption of Nature-based Solutions (NbS) and Ecosystem-based Adaptation (EbA). This results in vulnerability to floods, water scarcity, landslides, and other climate-related risks. Existing early warning systems (EWS) have limited coverage, and climate-informed decision-making often lacks data-driven analytics. Further, there is limited uptake of green buildings owing to the lack of capacity.

### **With LDCF financed intervention**

The GEF investments will be utilised for strong integration and promotion of NbS, capitalising from the institutional coordination, policy coherence and capacity support under component 1.

The adaptive capacity of the network of water and stormwater management systems will be further strengthened and climate-proofed to enhance effective flood risk management, a secure and uninterrupted water supply, and continuity of critical urban activities through incorporation of NbS. The Thimphu Paro Regional Strategy, along with the urban plans for Thimphu and Paro, advocate for the use of NbS, and most activities stem from these plans. These activities would include construction of urban forests, wetlands and retention ponds, riverbank and landslide stabilisation, watersheds restoration, daylighting of drainage system and other (Output 2.1 and 2.2, activities described in Annex 24 - Assessment of NbS and waterflow management). Further, the LDCF interventions through this component shall entail enrichment of water resources and demonstration of green building besides vibrant and real-time documentation and dissemination of climate information and advisory.

### ***Innovative technologies and Data Analytics***

The project harnesses cutting-edge technologies of GIS, IoT, green building tool(s) and SCADA, to produce data analytics to inform risk-based gender responsive decision-making in urban planning. This technological integration and training enhance the precision and effectiveness of decision processes. Concurrently, the project will enhance community safety and adaptive capacity through the establishment of early warning systems specifically designed for climate-related hazards, ensuring timely responses and proactive measures. The technology and training manuals will be developed and applied for future scalability and replicability (Output 2.4).

This outcome will support climate-proofing and upgrading of water and stormwater management systems through NbS that is responsive to impact of climate extremes (Output 2.1). Likewise, the project will promote resilient, green and inclusive building design and technologies through the construction of new climate-resilient/adaptive building in Thimphu and renovation of existing buildings in Paro. Both buildings would be used for public purposes (Output 2.3). The adaptive capacity of city landscapes will be further advanced through development and installation of ancillary rainfall threshold-based EWS along critical tributaries of Thimphu and Paro River basins. This will be integrated with the existing centralized hydro-met data management system of National Centre for Hydrology and Meteorology (NCHM) (Output 2.4).

In connection with the individual contract for on-the-ground interventions, under this outcome, site-specific social and environment screening will be done, for the individual intervention sites, by the Project's Safeguard Specialist in collaboration with the Government counterparts to ensure the UNDP SES requirements are fully taken into account in the contracting process. As part of the call for proposal contractors will be informed about the identified site-specific risks. They will also be instructed that an important selection criterion will be the inclusion of appropriate risk mitigation measures to be undertaken by the company during contract execution.

***Output 2.1: Climate-proofing features for the key sections of the water and stormwater management systems introduced to ensure flood risk management, safe and uninterrupted water supply and business continuity in critical urban areas***

## **Key results**

- **Developed Integrated stormwater management plan for Paro**
- **3.480 km of drainage system climate proofed by increasing capacity and renaturalisation of existing drains, along with construction of additional drains to manage excess flooding**
- **Assessment of existing treatment plants and implementation of remedial measures**
- **Installation of SCADA system for two water supply systems**
- **Implementation of interventions to ensure uninterrupted safe drinking water supply**

**This output will address flood risks due to stormwater runoff in the two urban areas (urban flooding) in accordance with the Water Services Master Plan and ensure safe and uninterrupted water supply through effective storage and efficient distribution of water in the critical urban areas of Thimphu and Paro. These will be enabled through climate proofing of infrastructure, including NbS, and digitisation of the water supply network.**

**The project will support the development and implementation of Integrated Stormwater Management Plan (ISMP) for Paro to enhance the capacity of primary and secondary drainage systems. Further, additional flood safety measures will be supported in Thimphu by rehabilitation of storm water drains. The Water Services Master Plan and the Green Infrastructure and Open Space master plan of Thimphu reiterates the provision of nature-based storm water drainage system as an integral part of the green infrastructure for the city. This master plan identifies the primary drains within the Motithang and Changangkha LAP, and City Center LAP (which are part of old city area) as the priority sites as these drainage systems have not been renovated for the last 15-20 years. The reconstruction of these drains with nature-based solutions would reduce the volume of surface runoff and minimize the incidences of flash floods in the urban core which has affected several businesses in the past. This activity will be led by the Department of Human Settlements from the Ministry of Infrastructure and Transport (MoIT), together with Thimphu and Paro municipalities.**

**Additionally, naturalizing the existing channelized streams within the city core (five fingers- stream next to Memorial Chorten, Stream below swimming pool complex, Stream next to Bhutan Post office, Stream along BDBL, Stream next to City Cinema) will further enhance the overall storm water system of the city core covering neighborhoods such as Motithang, Changangkha, Norzin, Changzamtog and Kunga Choling.**

As conventional drinking water treatment systems were not designed with climate change in mind, existing treatment plants will be assessed for their effectiveness in managing water quality and quantity variations. Following this assessment, the project will support the implementation of remedial measures such as upgrading storage, treatment, and distribution systems to mitigate climate change risks and improve water supply reliability and adaptability.

Moreover, this output aims to enhance water supply system by improving the water distribution network, installing water storage facilities, and implementing measures to reduce non-revenue water (NRW), all aimed at addressing water shortage issues exacerbated by the impacts of climate change. Additionally, SCADA will be installed in two water supply systems. Digitization will focus on maintaining information about pipes, transmission mains, distribution networks, storage tanks, and treatment plants in digital format (GIS), enhancing water infrastructure planning, operations, and maintenance. Also, a study on governance options for the operation and maintenance (O&M) of water supply systems will be conducted as part of the project preparation for water supply system improvement interventions, ensuring uninterrupted water supply in the face of a changing climate (sub-activity 2.1.3.4).

In some areas in Thimphu where main water lines pass and which are susceptible to landslides, replanting will be carried out with the aim of stabilizing the slopes and thereby reducing the risk of damage to this infrastructure. The two aforementioned activities related to water supply systems will be implemented by the Water and Sanitation Division, Department of Infrastructure Development from the MoIT, in partnership with Thimphu and Paro municipalities.

#	Activity / Sub-activity	Year
2.1.1	<b>Technical assessment and intervention of the existing stormwater management system and future needs for Paro Municipality.</b>	1-4
2.1.1.1	Development of the inventory of the existing stormwater Drainage Network	1-4
2.1.1.2	Preparation of Integrated Stormwater Management Plan (ISWMP) for Paro	1-4
2.1.1.3	Implementing NbS integrated storm water interventions in Paro municipality	1-4
2.1.2	<b>Implementation of Green Infrastructure and Open Space Master Plan for Thimphu Water Services Master Plan by improving the stormwater management system and introduction of NbS and EbA solutions to reduce urban flooding.</b>	1-4
2.1.2.1	Rehabilitation of the primary storm water drains for capacity enhancement and integration of NbS in Thimphu municipality	1-4
2.1.2.2	Rehabilitation of secondary storm water drainages (connecting drains) for proper management of surface runoff and wastewater in Thimphu municipality	1-4
2.1.2.3	Lateral Drainage system demonstrated for partial diversion of stormwater from the primary drainage system to reduce urban flood in low-lying areas in Thimphu municipality	1-4

2.1.2.4	Rehabilitation of stormwater drainage networks in Debsi, Motithang, Changangkha and City LAP in Thimphu municipality	1-4
2.1.2.5	Demonstrate flood safety measures along the primary stormwater drainage system and stream in Thimphu municipality	1-4
2.1.3	<b>Improve water supply management through the establishment of SCADA systems and implementation of interventions to ensure uninterrupted safe drinking water supply.</b>	1-4
2.1.3.1	Digitization of water supply system in Thimphu and Paro municipality	1-4
2.1.3.2	Installation of Sensors and SCADA system for water supply system	1-4
2.1.3.3	Promote climate risk informed planning of water supply through the assessment of existing treatment plants and implementation of remedial measure for Paro and Thimphu municipalities	1-4
2.1.3.4	Ensure uninterrupted safe water supply through appropriate interventions to combat climate change in Thimphu and Paro municipalities	1-4

***Output 2.2: NbS developed and implemented to support adaptation to floods, heat-island effect, and landslide and to enrich water sources, natural streams and catchments for improved infiltration, restoration and recharge***

### **Key results**

- 30.062 km of river corridors and 39.781 km of streams enhanced to adapt to floods through building gabion walls along riverbanks and clearing natural stream flow paths.
- Retention pond in Paro developed to maintain water level for flood resiliency and secure water during the dry season
- Developed Dzongkhag Integrated Water Resources Master Plan for Paro and Thimphu
- 800 hectares of watershed/springshed restored
- 85.32 hectares of urban/riverine forests created
- 0.5 km of landslides stabilised
- 0.93 km of street trees in Thimphu and 35 ha of street trees in Paro implemented
- 8 km firelines constructed at the strategic locations/sites (4km within Thimphu and 4km within Paro)

Under this output, Wang Chu and Paro River corridor will be enhanced to manage the floodplain and restore riparian buffer, while fostering ecological restoration and improving biodiversity. Specifically, the Thimphu Paro Regional Strategy envisions and maps the development of urban forest along river corridors to enhance flood protection, biodiversity, but also recreational spaces. The total area of 899 ha developed for climate adaptation will include springsheds and watersheds, urban forestry and road side greening through afforestation and reforestation. This will contribute to the watershed restoration measures to improve the aquifer recharge, slope stabilisation and reduce urban heat-island effect while increasing carbon sequestration capacity.

As a part of road side greening, we are focused on river corridor intervention, greening of river corridors along the Wangchu River as it will likely contribute more to our effort to increase the adaptive capacity of the community against the climate-induced floods as well as urban heat management. Furthermore, the total area of land developed for climate adaptation has increased from 400 ha in PIF to 800 ha in PPG as it now includes springsheds and watersheds, and an additional area of 99ha (60 ha in Thimphu and 39 ha in Paro) as urban forestry and green spaces in Thimphu and Paro region through afforestation and reforestation. Slope stabilization measures along the river corridors through restoration will also be implemented. Additionally, watersheds upstream will be restored through watershed restoration measures to improve the aquifer recharge. Retention ponds will be created along the riverside in Thimphu and Paro by arranging natural gabion walls. Natural gabions are made of permeable rock debris and will protect from overflows.

The project will also demonstrate flood safety measures along the primary stormwater drainage system and streams in Thimphu City. This includes urban forestry along the streams, bioswale for flood protection, as well as urban infiltration and groundwater recharge to reduce surface runoff during rainy seasons. Additionally, during dry and hot periods, the forest will provide shade and help mitigate the urban heat island effect, while also serving as a biological corridor

In addition, surrounding water catchment areas will be rehabilitated through creation of urban wetlands and retention ponds along the riverside in Thimphu and Paro by arranging natural gabion walls, to improve infiltration and recharge. This output will also implement climate resilient flood management measures with hybrid infrastructure, such as vegetated gabions and footpaths, along critical areas of Pa-chu and Wang Chu embankments to safeguard public infrastructure and vulnerable communities. These activities would be implemented by the Department of Human Settlements under the MoIT, together with Thimphu and Paro municipalities.

Furthermore, with Thimphu and Paro being prone to forest fires, particularly during the winter seasons with intensifying dry conditions due to climate change, 8 km long fire breaks (fire lines) will be created at strategic locations within the city and along the municipal

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**boundary. To protect and restore watersheds within Thimphu and Paro municipality, degraded areas will be assessed and restored by reforesting native vegetation and implementing soil conservation practices. These activities will be led by the Department of Forest and Park Services (fire lines) and Department of Water (watershed restoration), both under the Ministry of Energy and Natural Resources.**



This output will support the implementation Green Infrastructure and open Space Master Plan for Thimphu, and similarly for Paro.

#	Activity	Year
2.2.1	<b>Development of urban forestry/greening to reduce urban heat island effect, flooding, and enhance carbon sequestration.</b>	1-6
2.2.1.1	Enhancement of Wangchhu River Corridor to adapt to floods and landslide through riverbank stabilisation and urban forests development	1-6
2.2.1.2	Creation of fireline to control forest fire along Thimphu and Paro Municipal Boundary	1-6
2.2.2	<b>Rehabilitation and protection of water sources, natural streams, and catchments for improved filtration, recharge, and restoration.</b>	1-6
2.2.2.1	Development and implementation of a retention pond at Jangsa water supply source to maintain water level for flood resiliency & dry season	1-6
2.2.2.2	Assess degraded or critical watersheds/springshed in Thimphu and Paro	1-6
2.2.2.3	Design and implementation of nature-based watershed/springshed <b>revival interventions, including potential natural gabion walls, in the above watersheds/springsheds</b>	1-6
2.2.2.4	Develop Dzongkhag-level Integrated Water Resources Master Plan for Paro and Thimphu	1-6
2.2.3	<b>Flood risk management to protect public infrastructure and vulnerable communities using ecosystem/NbS.</b>	1-6
2.2.3.1	Implementation of climate-resilient flood management safety measures for Paro	1-6
2.2.3.2	Implementation of climate-resilient flood management safety measures for Thimphu	1-6

### ***Output 2.3: Measures to increase climate resilience of buildings and design of urban spaces introduced***

#### ***Key results***

- **Enhanced green building standards**
- **Online green building tool developed**
- **6 climate resilience solutions integrated into public buildings**

The overall approach for the output can be segregated into two aspects: (i) demonstration aspects (ii) policy/regulatory aspects.

The project will implement climate-resilient strategies/interventions in two sites: (i) Demonstrate inclusive and climate-resilient building technology in Thimphu, and (ii) A public building with inclusive and climate-resilient technology in Paro. These interventions will address climate resilience in two ways: (a) Through climate resilient structures that focus on improved indoor environment for the inhabitants (b) Through interventions that aim to complement the higher (human settlement) level efforts and issues such as water scarcity, urban flooding, urban heat island, among others. The interventions foreseen are rainwater harvesting and (semi-)permeable paving around the buildings or other infrastructures which will result in the reduction of stormwater runoff in urban areas which causes urban flooding.

Currently, the Building Code of Bhutan cites compliance with the Bhutan Green Building Design Guidelines. However, the guideline has not been revised since 2013. Hence, the Bhutan Green Building Design Guidelines will be updated to a green building standard/guide and a tool. The revision would be guided by applicable policies and tools across the globe and the learnings from this project. Consequently, as MoIT is the lead agency for infrastructure, in the future, the tool may also serve as one of the criteria for green taxonomy or other climate incentive interventions.

This output will focus on the introduction of green and climate resilient interventions in public buildings and urban spaces through construction of new climate-resilient buildings in Thimphu and retrofitting old building in Paro. These buildings will serve as functional testbeds and guides to encourage public adoption of interventions to withstand and adapt to climate change impacts such as extreme weather conditions and urban floods. The technologies include integrating climate-resilient measures like rainwater harvesting and (semi-)permeable paving around the buildings or other infrastructures, which will lead to the reduction of stormwater runoff in urban areas. Other adaptation intervention to make buildings more resilient to the impacts of climate change will be finalized during implementation (e.g. greening, low-flow faucets to complement supply side interventions of water scarcity, improve building envelope and systems to tackle increased temperature variations, ). The culmination of these interventions is expected to address climate change related issues such as urban flooding, water scarcity, varying weather patterns, and catering to the built environment and the users , low-E windows ensuring airtightness and resilient thermal environments. The costs will be co-financed by RGOB and ADB for Thimphu and Paro, respectively. This will be implemented by the Sustainable and Resilient Building Division, Department of Human Settlements under the Ministry of Infrastructure and Transport, together with Thimphu and Paro municipalities.

Towards this, comprehensive green building standards will be developed that will take into account sustainable construction practices, inspired by applicable practices across the globe as well as the ADB's Green and Resilient Affordable Housing project efforts. The Department of Human Settlement, as the custodian of the Building Code of Bhutan, plans to update the Green Building Guideline with green standards and tools, incorporating Nature-based Solutions (NbS) and climate-resilient features for the built environment. These standards and tools will be based on existing groundwork, including the Bhutan Green Building Design Guidelines, Bhutan Energy Baseline for the Building Sector, and the Building Code of Bhutan. Ultimately, the green standards (or parts of them) will be integrated into the Building Code of Bhutan.

Additionally, tools including a green building software system will be developed for architects, engineers, builders, private entities, and stakeholders in the construction

industry to incorporate green building elements into their building projects including the surrounding spaces. The tool(s) will be utilised to verify if potential constructions conform to the green standard. This also includes enhancing integration of urban greening adjacent to roads, walkways, and open urban spaces.

#	Activity / Sub-activity	Year
2.3.1	<b>Promotion of green climate-resilient buildings through green building tools and standards.</b>	1-4
2.3.1.1	Develop Green Building standard and incorporation in the revised Bhutan Building Code	1-4
2.3.1.2	Develop green building tools	1-4
2.3.2	<b>Introduction and promotion of climate resilient construction technology in buildings and urban space.</b>	1-6
2.3.2.1	Demonstrate inclusive and climate resilient building technology in Thimphu such as rainwater harvesting and (semi-) permeable paving	1-6
2.3.2.2	Retrofitting of an existing public building with inclusive and climate resilient technology in Paro	1-6

***Output 2.4: Ancillary rainfall threshold-based flood EWS developed on critical tributaries and integrated with the existing centralized hydro-met data management system (CDMS) of NCHM***

### **Key results**

- Four short / long stream gauging stations and five weather and climate monitoring stations installed
- Developed flood forecasting model for Paro and Thimphu River basin including tributaries
- Integrated down scaled weather forecasting data (Wrf) for the flood forecasting model of EWS
- Developed Flood Warning dissemination platform [web based] for EWS
- Stakeholders sensitised on the flood risk and management

There is a gap in past and ongoing interventions for early warning systems in the Thimphu-Paro region. The project funded by the Government of Japan enhances flood warning system in Thimphu and Paro but overlooks critical tributary streams prone to flash floods. To address this gap, the project will extend coverage to these streams, focusing on flood-prone areas. The enhancement of flood early warning system (FEWS) will improve effectiveness of emergency preparedness, response and overall risk reduction poised by very short lead time.

To enhance the effectiveness of emergency preparedness, response, and overall risk reduction posed by very short lead time, the project will support enhancement of flood early warning system (FEWS) based on the flood forecast. The downscaled weather forecasting data will be integrated with the flood forecasting model of EWS and the central hydro-met data management system (CDMS) of the National Centre for Hydrology and Meteorology (NCHM). The existing web-based platform will also be enhanced for improved dissemination of flood warning. New weather and climate monitoring stations within the urban areas and in higher altitude of Thimphu and Paro will be established, the existing critical hydromet stations will be rehabilitated and the short- and long-term stream gauging stations will be set up in the critical tributaries of the Paro and Thimphu River basins. These stations will provide weather parameters, input data, and crucial information on the hydrological response, status of the streams for operating flood forecasting system for real-time data assimilation and the model calibration and validation.

The project will also improve the efficiency of services through standard operating procedures (SOPs) for operation, maintenance, and information dissemination protocol for EWS. The EWS will be strengthened through timely monitoring, detection and issuance of flood warning. The sensitization and awareness program for the EWS in project basin will be carried out in consultation with the local government and the communities. This output will be led by above-mentioned NCHM in partnership with Thimphu and Paro municipalities.

#	Activity / Sub-activity	Year
2.4.1	<b>Develop forecast-based flood EWS in flood-prone areas in the tributaries of the Thimchhu and Pachhu river basin.</b>	3-4
2.4.1.1	Develop flood forecasting model for Paro and Thimphu river basin including tributaries	3-4
2.4.1.2	Integration of down scaled weather forecasting data (Wrf) to the flood forecasting model of EWS	3-4
2.4.1.3	Development of Flood Warning dissemination platform (web based) for EWS	3-4

2.4.2	<b>Enhance hydrometeorological monitoring stations in Pachhu and Thimchhu basin.</b>	1-3
2.4.2.1	Establishment of short-long term stream gauging stations with ambient water quality monitoring sensors	1-3
2.4.2.2	Establishment of Weather and climate monitoring station in high altitude and Urban areas	1-3
2.4.2.3	Rehabilitation of critical hydro met stations in Paro and Thimphu	1-3
2.4.3	<b>Develop Standard Operations and Maintenance manual of EWS, and train staff and relevant community members.</b>	5-6
2.4.3.1	Develop Standard Operating Procedure (SOP) for operation, maintenance and information dissemination protocol for the EWS	5-6
2.4.3.2	Sensitization on the flood risk and management to relevant stakeholders through participatory approach to enhance resiliency against flood risk	5-6

### Component 3: Knowledge management, gender-responsive monitoring and evaluation

**Outcome 3: Project knowledge is managed, and project results are monitored and evaluated to foster learning, adaptive management, sustainability and replication**

**Total budget GEF-LDCF: \$ 763,000; Co-financing: \$ 5,700,000**

#### Baseline scenario

At present, there is a deficiency in institutional expertise, technical capabilities, and the readiness for widespread adoption in the progression of climate resilience. The project sustainability, scalability and replication of good practices often suffers from limited focus on knowledge management, capacity, learnings and lessons from past projects and initiatives. This includes restricted understanding and familiarity with urban climate and adaptive solutions as well as low awareness, thereby affecting cities adaptive capacity and resilience building. In addition, the current monitoring and evaluation system is constrained by lack of disaggregated data and capacity for adaptive risk informed and evidence-based planning.

#### With LDCF financed intervention

The project emphasises strengthening institutional technical capacity and knowledge management system which will be instituted to support resilient, integrated and innovative investment in urban planning. Recognizing the continuity and long-term sustainability, the project will ensure generation of knowledge products and services. This includes ensuring information and knowledge accumulated and produced within the project is well documented and made available for wider communication and advocacy to support the replication and scaling-up of project results (Output 3.1). Key knowledge products, developed in collaboration with the academic sector, will comprise: 1) Catalogue of NbS tailored for mountainous cities, 2) Strategy aimed at involving entrepreneurs and community initiatives in local adaptation planning, and 3) NbS accelerator program.

Knowledge management and dissemination activities under output 3.1 will build on the robust Monitoring, Evaluation and Learning (MEL) under output 3.2. The cyclical MEL process begins with a comprehensive M&E plan aligned with the project objectives and results framework, followed by ongoing data collection through diverse methods including surveys, interviews, meetings and workshops, and observation. This data is analysed to assess progress, indications of impacts and to identify emerging lessons. Findings from this analysis will inform adaptive management, and the dissemination activities of output 3.1

Furthermore, acknowledging project's replication potential, exchange programme for other thromdes (cities and towns) in Bhutan will be provided, with aim to assisting them in developing their replication action plans. These plans will prioritize the transfer of selected project results, depending on the specific needs and context of each thromde (Output 3.1). This may include focusing on implementation of specific urban resilience measures, developing local adaptation plans or strategies for involving entrepreneurs in adaptation actions, piloting NbS accelerators, or innovative financing mechanisms.

***Output 3.1: Knowledge and communication products and platforms developed to analyse and disseminate best practices and project lessons***

#### ***Key results***

- Communication and dissemination strategy developed
- 20 gender-friendly knowledge products developed and disseminated
- Publications on key project outcomes developed and distributed

- Over 120,000 people informed about nature-based solutions

This output will develop and implement a gender-responsive communication plan and strategy for dissemination of project related information (collected and analysed in output 3.2) to key target groups. The communication will be enhanced through dedicated platforms and seamless integration to the virtual Bhutan Climate Platform (supported by the NAP Readiness Project).

Knowledge management materials will capture and disseminate project success stories, case studies, and lessons learned, illustrating the theory of change. Further, inclusive documentation will be produced on traditional knowledge for urban resilience, green building tools, gender and climate change, NbS for resource management and NbS entrepreneurship. Under this component, collaboration and research efforts with Royal University of Bhutan related to urban resilience will be supported. Also, exchange programmes at thromde level (municipal level) shall ensure cross-breeding of best practices for replicability in other urban centres. This primarily includes: other 3 Class A and 10 Class B<sup>[1]50</sup> thromdes (municipalities) in Bhutan, as well as Mindfulness City<sup>[2]51</sup>, a new city which aims to become a model of growth and innovation rooted in Bhutanese landscape and culture, as well as integrate nature into design. The project shall organise international and regional events on climate-resilient urban development. Knowledge, Attitude, and Practice (KAP) surveys will capture the transformation, evaluation and understanding of the project interventions.

#	Activity / Sub-activity	Year
3.1.1	<b>Develop gender-responsive communication plan and creation of social media accounts and website.</b>	1-2
3.1.1.1	Development of gender-responsive communication plan and strategy for dissemination of project information through communication channels	1-2
3.1.1.2	Establishment of website, linkage to existing climate associated platforms and opening social media accounts for the timely information sharing	1-2
3.1.2	<b>Produce communication materials, research articles and publications focusing on climate and urban resilience, as well as booklets on some of the key project outputs.</b>	1-6
3.1.2.1	Prepare videos / brochures / flyers / poster and other communication materials on project success stories, case study, progress, lessons learnt and impact stories describing the theory of change.	1-6
3.1.2.2	Publication of books / research / articles on climate / urban resilience	1-6



3.1.2.3	Publication on key project outputs	1-6
3.1.3	<b>Exchange programme for public and private sector representatives from other thromdes, and support to development of localised replication action plans.</b>	2-4
3.1.3.1	Support to exchange programme for public and private sector from other thromdes and development of localised replication action plans	2-4
3.1.4	<b>Organise and attend international and regional conferences, seminars, trade EXPOs on climate resilient urban development. Organise study visits and exchange programmes for university staff, students, TVET trainers and component managers.</b>	1-6
3.1.4.1	Study visits and exchange programs for staff and students, TVET Trainers and component managers	1-6
3.1.4.2	Organise and attend international and regional conferences, seminars, trade EXPOs on climate resilient urban development	1-6
3.1.5	<b>Undertake Knowledge, Attitude and Practice surveys.</b>	4, 6
3.1.5.1	Carrying out regular knowledge, attitude and practice surveys	4, 6

***Output 3.2: Project progress and results are effectively tracked and managed through monitoring and evaluation***

The project will establish a robust Monitoring and Evaluation (M&E) system, as required by GEF-specific M&E policies, to ensure adaptive management and consistent tracking of project outcomes. Project implementation report (PIR) will be carried out annually. An independent mid-term review (MTR) will assess progress at the project's mid-point, followed by an independent terminal evaluation (TE) upon completion of major outputs and activities. Additionally, other M&E activities necessary to support project-level adaptive management will be agreed upon, including during the Project Inception Works, and detailed in the Inception Report. This work will be supported by the Gender Expert and M&E expert in the PMU, who will provide support to project activities under all three components.

The M&E plan and budget provided in the section below will be regularly reviewed and updated to ensure the project remains adaptive and responsive to emerging risks and challenges. M&E findings will ensure that project remains responsive to the needs of beneficiaries and stakeholders, ultimately enhancing its ability to achieve objectives effectively and efficiently. Likewise, the GEF Operational Focal Point will ensure consistency in the approach taken to the GEF-specific M&E requirements (notably the GEF Tracking Tools).

#	Activity / Sub-activity	Year
3.2.1	<b>Project monitoring and evaluation.</b>	1-6
3.2.1.1	Annual Planning and review workshop which includes plan preparation and monitoring of indicators in project results framework for adaptive management, annual lesson learning session among project stakeholders; Complete annual PIR and conduct mid-year review of annual work plan implementation status for adaptive management of project activities.	1-6
3.2.1.2	Baseline Survey and assessment as necessary to update all indicators in the results framework at mid-term and end of project.	1,3,6
3.2.1.3	Preparation of the annual GEF Project Implementation Report (PIR)	1-6
3.2.1.4	Technical Advisory Committee meetings and sessions.	1-6
3.2.1.5	Monitoring of <ul style="list-style-type: none"> <li>project safeguards management plans and GRM</li> <li>gender action plans</li> </ul>	1-6
3.2.1.6	Supervision and Learning missions	1-6
3.2.1.7	Field consultations and meetings related to MTR and TE.	3, 6
3.2.1.8	Independent Mid-term Review (MTR)	3
3.2.1.9	Independent Terminal Evaluation (TE)	6

## Relevant Stakeholders

**Table 1**

Stakeholder	Role/Contribution
<b>National Level</b>	
Ministry of Infrastructure and Transport	<p>MoIT's Department for Human Settlements will be leading several outputs, such as Output 1.2 on establishment of climate GIS system, Output 2.1 on climate-proofing key sections of the water and stormwater management systems, Output 2.2 on NbS for water sources, natural streams and catchments, as well as Output 2.3 on measures for climate resilient buildings and urban spaces.</p> <p>MoIT's Policy and Planning Division will be engaged as a lead for Output 1.1 on improving inter-agency coordination and policy coherence. In addition, the Department of Infrastructure Development will be leading activities under Output 2.1 relating to improvement of water supply systems.</p>
Ministry of Energy and Natural Resources	<p>MENR's Department of Environment and Climate Change will be engaged as a lead in Output 1.3 activities related to development of local adaptation plans for Thimphu and Paro. The Department of Water will be a key partner for activities under Output 2.2 relating to implementation of NbS for water resources, natural streams and catchments improvement. Also, MENR's Department of Forest and</p>

	Park Services will be a key partner for activities under Output 2.2. relating to use of NbS for watershed/springshed revival and fluvial flooding management,
Ministry of Industry, Commerce and Employment	MoICE's Department of Employment and Entrepreneurship will be engaged to lead activities under Output 1.3 relating to stimulating entrepreneurship for NbS.
Ministry of Education and Skills Development	MoESD's Department of Workforce Planning and Skills Development will be engaged as a lead under Output 1.4 relating to assessment of existing and development of new training and educational programmes for urban resilience.
Ministry of Home Affairs	MoHA's Department of Local Governance and Disaster Management will be a partner in Output 1.2 relating to establishment of GIS system with downscaled climate and vulnerability data.
Ministry of Finance	MoF's Department of Macro-Fiscal and Development Finance will be a lead for activities under Output 1.5 relating to development of innovative financing mechanisms for urban resilience and NbS.
Royal Monetary Authority	RMA will be engaged to lead several activities under Output 1.5, more specifically in assessment and development of policy supporting incentive system for green financing for financial institutions, as well as in implementation of training package for financial institutions.
National Land Commission Secretariat	NLCS will participate as a partner under Output 1.2 relating to establishment of climate GIS system.
National Centre for Women and Children	NCWC will be a partner in activities under Output 1.3 relating to development of local gender-responsive adaptation plans and community NbS plans.
National Centre for Hydrology and Meteorology	NCHM will be engaged as a lead for activities under Output 2.4 relating to the integration of EWS systems in tributary streams of Thimphu and Paro basins into existing hydrological centralised database management.
<b>Local Level</b>	
Thimphu Thromde and Paro Dzongkhag	<p>Thimphu Thromde and Paro Dzongkhag will be executing partners delivering the project on-ground. Additionally, various administrative divisions within the Thimphu-Paro region, including Thimphu Dzongkhag and Gewog Administrations surrounding the boundaries of Thimphu and Paro thromdes, will participate in certain project activities.</p> <p>Local level administrations will be main collaborators in Component 1, more precisely in Output 1.1 concerning policy coherence, Output 1.2 developing localised climate-risk maps for enhanced GIS system, Output 1.3 developing gender-responsive adaptation plan and stimulating local entrepreneurship, as well as in Output 1.5 related to development of innovative public financing instruments for climate resilient projects. Within Component 2, their main responsibilities will include, supervising the construction and installation activities of the project, coordinating with local communities, supporting the development of guidelines, standards, and best practices.</p>
Other regional and local level authorities	Other dzongkhags and thromdes will be participating in streamlining of inter-agency mandates and functions, as well as in the design of multi-dimensional climate GIS-system used by DHS. Also, will be engaged in Component 3, particularly in activity aiming for replication of nature-based solutions, and other project activities.
<b>Other</b>	

Educational and learning institutions	Royal University of Bhutan and its colleges will be engaged in Output 1.4 relating to assessment of existing and development of new training and educational programmes for urban resilience.
Entrepreneurs	Entrepreneurs will be involved in Output 1.3 focusing on stimulating private sector involvement in local climate adaptation actions. Also, entrepreneurs will have access to various educational initiatives, accelerator programs, and investment opportunities, along with access to new and improved financial mechanisms. Their involvement in project activities will be facilitated through umbrella associations, public calls, and direct invitations.
Financial institutions	Financial institutions will participate in Output 1.5 to evaluate existing financing options and propose recommendations for enhancing and adopting innovative financing solutions for urban resilience. Additionally, they will receive extensive training to enable them to effectively implement upcoming green financing mechanisms, including climate stress testing, financing for nature-based solutions, and environmental and social risk Management (ESRM).
NGOs and communities	While the project focuses both on the individual and communities, the engagement and direction will be through the established interest groups such as NGOs and CSOs. They will play an active role in engaging communities before the development of gender-inclusive community plans for Nature-based Solutions (NbS), as in Output 1.3. Also, communities will be engaged during planning and design of physical interventions across Component 2.

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[1] <https://www.moit.gov.bt/wp-content/uploads/2010/11/tmodeA57-2-2012.pdf>

[2] <https://mcc.bt/>

## Institutional Arrangement and Coordination with Ongoing Initiatives and Project.

Please describe the Institutional Arrangements for the execution of this project, including financial management and procurement. If possible, please summarize the flow of funds (diagram), accountabilities for project management and financial reporting (organogram), including audit, and staffing plans. (max. 500 words, approximately 1 page)

UNDP is the GEF Implementing Agency for this project, while the Ministry of Infrastructure and Transport (MoIT) is the implementing partner. Following Government protocols all reporting and requests to and from the MoIT to UNDP CO will be routed through the Ministry of Finance (MoF). However, while the financial management and oversight rests with Ministry of Infrastructure and Transport (MoIT) several entities (ministries and agencies) will be entrusted with the responsibility of implementing specific project components.

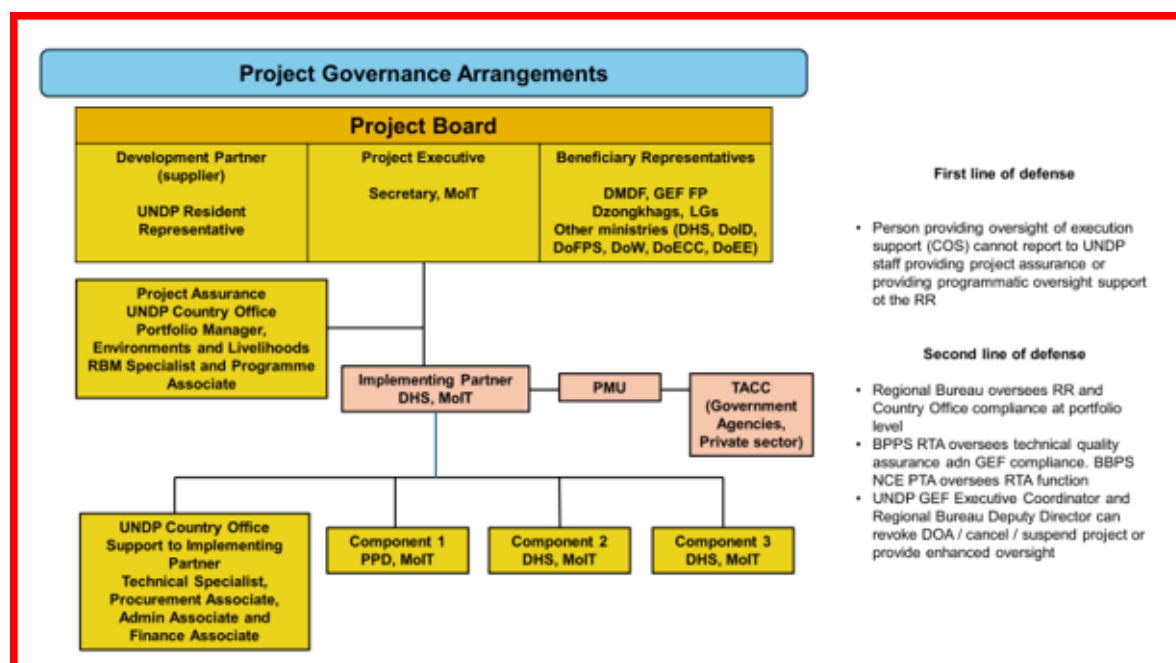
The project will be governed by a multi-stakeholder committee established to review performance based on monitoring and evaluation, and implementation issues to ensure quality delivery of results. The Project Board (also called the Project Steering Committee) is the most senior, dedicated oversight body for a project. For this project, following the GAAP, the project will recommend and prioritize female representation in the Project Board. The composition of the Project Board must include individuals assigned to the following three roles: Project Executive, Beneficiary Representative(s) and Development Partner(s). In addition, the project

will form the Technical Advisory Coordination Committee (TACC) including a representative from the private sector, serving as an advisory body to the PMU. The TACC will convene twice a year throughout the project duration, primarily to provide valuable insights and advice on the strategic direction of the project.

## Implementation

The Project Management Unit will be housed under the Ministry of Infrastructure and Transport (MoIT). MoIT will be responsible for managing and overseeing all components of the project. The Policy and Planning Division (PPD) of the Ministry will be responsible for coordination of Component 1, which encompasses improved institutional mandates and policy coherence for climate-resilient urban planning, development of gender-responsive local adaptation plans, educational and training activities, entrepreneurship and financing solutions for urban resilience. Department of Human Settlements (DHS) of MoIT will be responsible for components 2 and 3. Component 2 entails activities related to climate-proofing of key sections of water and stormwater management system, development of ecosystems and NbS interventions, as well as the EWS for tributary streams. Component 3 covers knowledge management and communication and monitoring and evaluation activities.

The diagram below illustrates the project institutional arrangements:



Will the GEF Agency play an execution role on this project?

Yes

If so, please describe that role here and the justification.

The implementation modality, contingent upon GEF approval, will be UNDP Country Office Support to National Implementation Modality (NIM) given that the application of Full NIM could pose wider administrative

challenges faced by the Government of Bhutan that could lead to risks of delays in implementation. CO Support to NIM will enable the project to overcome barriers related to (i) higher lead time for procurement, which could lead to delays, (ii) procurement of international expertise and innovation packages; (iii) delays in district-level activities; and (iv) the risk of project extensions being required. Therefore, the GEF Agency (UNDP) expects to play a supportive execution role in this project, including for district-level interventions, as well as the mobilization of all international experts using its existing procurement procedures.

Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing (max. 500 words, approximately 1 page)

The following table summarises ongoing initiatives that directly complement the intended objectives and outcome of the ECRUL project. This will be achieved through building synergies and collaboration with these initiatives including lessons and learnings of best practices and cost efficiency of investments. A summary of linkages between the projects and ECRUL follows the table.

Table 2

S l	Project/Initiative Title	Funding Agency	Implementing Entity	Duration	Grant (mill US\$)	Focal areas/Relevance	Type of Partnership
1	Advancing Climate Resilience of the Water Sector in Bhutan	GEF	UNDP	2023 to 2028	34.06	Watershed restoration, climate-proofing of water infrastructure, private sector engagement	Collaboration  Knowledge sharing
<p>The project has the objective to ensure sustainable water management at a basin level through improving institutional and financial capacity to adapt to water demand and supply mismatch, as well as ecosystem-based activities to restore watersheds and their hydrological regulation. Component 1 of ACREWAS project is upscaling PES scheme for watershed management in the districts of Punakha, Gasa and Tsirang. The same scheme will be applied in ECRUL project, within Output 1.5. but in the urban context of Thimphu and Paro.</p> <p>The ECRUL project and ACREWAS will be housed under the same ministry and the PMU team will report to the same Secretary, MoIT who serves as chair for the project board for both projects. Given the funding nature, the implementation requirements for ECRUL will align with those of ACREWAS. Therefore, the procedures, processes, and lessons learned from ACREWAS can be applied to the ECRUL project. Moreover, the Technical working group for the implementation of the ACREWAS is the task force member for the ECRUL project. The ECRUL project works as a scale up for the ACREWAS project, since the ACREWAS project focuses only on Specific areas of the Thimphu Thromde areas, whereas ECRUL replicates the technology in Paro urban Areas.</p>							
2	Strengthening Risk Information for Disaster Resilience (RIR)	WB and City Finance Gap Fund	WB	2021-2025	3.51	Disaster risk reduction, Hydromet and agromet services	Collaboration



Component A of the above project will establish a multi hazard risk assessment for hazards such as earthquakes, floods, and landslides. The web-based application is expected to have a GIS based decision support system that determines potential impact and empowers policymakers, operational users of Incident Response System, sectoral users and community members with necessary early warning information for decision making during all phases of disaster management. ECRUL project is focusing on the local level, and its Output 1.2 will use the aforementioned risk assessments as a basis for development of downscaled climate risk maps for Thimphu and Paro.

Components of the above project will involve groundwork studies and assessments of water and energy use models for different typology of buildings in the country. The results from the groundwork studies obtained from the RIR project will be used to determine the parameters for the green building tools and guidelines that will be developed through component 2.3 of ECRUL and also be potentially used in pilot projects. The additional parameters and associated ground work for the green building tool will be carried out through ECRUL. The RIR project serves as a foundational prerequisite to the ECRUL project, ensuring that the two initiatives will collectively achieve the activities under outputs of 2.3.

3	Green and Resilient Affordable Housing Sector Project	ADB	ADB	2021-2028	31	Green buildings, Affordable housing, Building codes	Collaboration  Potential joint sites / interventions
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Component 1 of this project will build 1,000 climate-resilient housing units, focusing on earthquakes and fire safety features. Meanwhile, Component 2 will focus on enhancing the institutional capacity, policy, and regulatory framework of the housing sector. Output 2.3 of the ECRUL project will build synergies with those of the ADB's Green and Resilient Affordable Housing Project which is collaborating with the National Housing Authority. As noted in Output 2.3, the Department of Human Settlement will continue to serve as the primary custodian of the Building Code of Bhutan. The revised building codes will establish the legal foundation for climate-resilient buildings, enabling the expansion of project interventions beyond the project's duration.

With regard to the housing agency, the housing agency (NHDCL) and DHS work closely during the design of their housing complexes (such as Phuentsholing Thromde and affordable housing projects). As NHDCL plans to construct housing complexes in Thimphu, the DHS aspires to include one of the housing complexes as the pilot project for Thimphu. Thus NHDCL and DHS plan to explore possibilities for collaboration for an affordable housing project in Thimphu. In addition, the NHDCL will be consulted during the development of the regulatory instruments to build synergy and collaboration.

4	Water flagship Program support Project in Bhutan	ADB	ADB	2022-2030	6	Water supply system, Digital water management	Collaboration  Knowledge sharing
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ECRUL project will develop climate-resilient water infrastructure and establish digital water management systems through its Outcome 2. ECRUL's Output 2.1 will climate-proof features of water and stormwater management systems to ensure flood-risk management, safe and uninterrupted water supply and business continuity in critical urban areas in Thimphu and Paro, including digitisation and SCADA of water supply systems. The ADB intervention is confined to Pamtsho water supply system development and does not consider water catchment protection and ecosystem. Whereas the ECRUL project will scale up the



ADB's pilot interventions to other critical sites as well as the broader water management aspects ensuring the sustainability and effectiveness of the project interventions. Through this project, SCADA systems will be implemented in Paro and critical areas of Thimphu which are not served by ADB project. The interventions will include institutional strengthening and transfer of knowledge and technology to prioritize and scale up the lessons /best practices by building synergy and avoiding any duplication of efforts.

5	Technical cooperation programme for capacity enhancement of meteorological observation, forecasting and flood warning for disaster preparedness and response in Thimphu and Paro Basins	JICA	JICA	2020-2024	TA	Disaster risk reduction, EWS	Collaboration  Knowledge sharing
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Output 2.4 of ECRUL project will develop threshold-based flood Early Warning systems by establishing stream gauging stations on critical tributaries/major streams (which were not covered by the JICA's project) and integrate this data with existing centralised hydro-met data management system of the National Centre for Hydrology and Meteorology (NCHM). The real-time data and information from these monitoring stations will provide crucial information on the status of the streams and understand and predict hydrological processes.

6	Bhutan Human Capital Recovery and Resilience Program	WB	WB	2022-2025	43.01	Education, Human capital development	Collaboration
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Output 1.4 of ECRUL project is aimed at implementing training programmes in colleges and technical schools for planning professionals. These programmes will include topics such as climate-resilient planning and disaster risk recovery. ECRUL will coordinate with the above project in relation to entrepreneurship development, skilling of the construction workforce for green and resilient building and the institutionalization of knowledge. In addition, the ECRUL project will draw insights from the WB project to assess the effectiveness of their training delivery and the suitability of the chosen training modalities, thereby enhancing the design of its capacity building activities.

7	Regional Project on Building Climate Resilience of Urban System through Ecosystem based Adaptation in the Asia- Pacific	GEF	UNEP	2017-2025	6	Capacities for use of climate information and early warnings. Participatory adaptation and mitigation measures for water	Collaboration
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						infrastructur e	
ECRUL project will use the lessons learned from the restoration of part of the Thimphu River and the slope treatment at Zilukha (as well as any other potential interventions to be implemented) to steer the activities in the Output 2.2. ECRUL will develop multiple Ecosystem-based Adaptation (EBA) solutions in Thimphu rather than one-off pilots and is also aiming to tackle systemic issues.							

## Core Indicators

	Core Indicator	Total	Male	Female	% of for Women
1	Number of direct beneficiaries	146,298	75,211	71,087	48.59
2	(a) Area of land managed for climate resilience (ha)	800			
	(b) Coastal or marine area managed for climate resilience (ha)	0			
3	Total number of policies, plans, and frameworks that will mainstream climate resilience	3			
4	Number of people trained or with awareness raised	200	100	100	50
5	Number of private sector enterprises engaged in climate change adaptation and resilience action	2	1	1	50

Core indicator 1 is derived from the aggregated beneficiaries from the Total no. of direct beneficiaries from more resilient physical and natural assets (indicators corresponding to Output 1.1.1 of the LDCF Core Indicator tracking tool); Total no. of direct beneficiaries with diversified and strengthened livelihoods (Output 1.1.2); Total no. of direct beneficiaries from the new/improved climate information systems (Output 1.1.3), and Total no. of entrepreneurs supported (Output 1.2.1).

Core indicator 2 is derived from ha. Of urban landscape managed for climate resilience (output 1.1.1).

Core indicator 3 is the sum of policies/plans that mainstream climate resilience (Output 2.1.1), and policies/plans that support NAP processes (Output 3.1.1).

Core indicator 4 is the sum of number of people trained regarding climate change impacts and appropriate adaptation responses (Output 2.3.1 and Output 3.3.1).

Refer to Annex 14 of the ProDoc for additional information.

## Risks to Achieving Project Outcomes

The project has a comprehensive risk management framework supported by risk assessments provided in Annex F: UNDP Social and Environmental Screening Procedure, and the UNDP Risk Register (Annex 6 in the UNDP Project Document). The project has identified twelve risks that could affect the achievement of project results, of which five are moderate and seven are low. The five moderate risks have been included in the risk table below. The overall risk rating for the SESP is **moderate**. As noted in the SESP the project will have a specific social and environmental safeguard focus with regard to its engagement with private sector contractors. To ensure that safeguards are thoroughly embedded in the project's on-the-ground interventions the project will ensure that the safeguards will be put in place to manage the risks identified during the design as well as emerging risks during the implementation phase. The contractor will furthermore engage in adequate mitigation efforts to address the identified risks. In this, the project's national social and environment expert, supported by an international safeguard expert, will work closely with government counterparts.

Stakeholder accountability measures include clear communication channels, feedback mechanisms, and stakeholder engagement procedures. Governance involves a multi-stakeholder Project Board and a Technical Advisory Committee. Monitoring and evaluation systems, including Grievance Redress Mechanism (GRM) and Stakeholder Response Mechanism (SRM), ensure ongoing engagement and transparency.

To enhance sustainability and resilience, the project focuses on strengthening institutional capacity and technology, including climate risk-informed urban planning, climate-smart construction, and NbS for flood control and water security. Training programmes, knowledge sharing, and innovative financing mechanisms support these efforts.

## Core Indicators

Indicate expected results in each relevant indicator using methodologies indicated in the GEF-8 Results Measurement Framework Guidelines. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

### META INFORMATION – LDCF

LDCF <b>true</b>	SCCF-B (Window B) on technology transfer	SCCF-A (Window-A) on climate Change adaptation
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	<b>false</b>	<b>false</b>
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Is this project LDCF SCCF challenge program?

**false**

This Project involves at least one small island developing State(SIDS).

**false**

This Project involves at least one fragile and conflict affected state.

**false**

This Project will provide direct adaptation benefits to the private sector.

**false**

This Project is explicitly related to the formulation and/or implementation of national adaptation plans (NAPs).

**true**

This project will collaborate with activities begin supported by other adaptation funds. If yes, please select below

Green Climate Fund	Adaptation Fund	Pilot Program for Climate Resilience (PPCR)
<b>false</b>	<b>false</b>	<b>false</b>

This Project has an urban focus.

**true**

This project will directly engage local communities in project design and implementation

**true**

This project will support South-South knowledge exchange

**false**

This Project covers the following sector(s)[the total should be 100%]: \*

Agriculture	0.00%
Nature-based management	20.00%
Climate information services	20.00%
Coastal zone management	0.00%
Water resources management	0.00%
Disaster risk management	20.00%
Other infrastructure	30.00%
Tourism	0.00%
Health	0.00%
Other (Please specify comments)	
Policies, capacity building, KM	10.00%
Total	100.00%

This Project targets the following Climate change Exacerbated/introduced challenges:\*

Sea level rise	Change in mean temperature	Increased climatic variability	Natural hazards
<b>false</b>	<b>true</b>	<b>true</b>	<b>true</b>
Land degradation	Coastal and/or Coral reef degradation	Groundwater quality/quantity	
<b>false</b>	<b>false</b>	<b>false</b>	

## CORE INDICATORS – LDCF

	Total	Male	Female	% for Women
<b>CORE INDICATOR 1</b>				
Total number of direct beneficiaries	146,298	75,211.00	71,087.00	48.59%
<b>CORE INDICATOR 2</b>				
(a) Area of land managed for climate resilience (ha)	800.00			
(b) Coastal and marine area managed for climate resilience (ha)	0.00			
<b>CORE INDICATOR 3</b>				
Number of policies/plans/ frameworks/institutions for to strengthen climate adaptation	3.00			
<b>CORE INDICATOR 4</b>				
Number of people trained or with awareness raised	200	100.00	100.00	50.00%
<b>CORE INDICATOR 5</b>				
Number of private sector enterprises engaged in climate change adaptation and resilience action	2.00			

### SUB INDICATOR 1

	Total	Male	Female
1.1 Number of direct beneficiaries from more resilient physical and natural assets	125818	64,682	61,136
1.2 Number of direct beneficiaries with diversified and strengthened livelihoods and sources of income	8778	4,513	4,265
1.3 Number of direct beneficiaries from the new or improved climate information services including early warning systems	11702	6,016	5,686
1.4 Number of youth (15 to 24 years of age) benefiting from the project	0	0	0
1.5 Number of elderly (over 60 years of age) benefiting from the project	0	0	0
1.6 Increased income, or avoided decrease in income (per capita in \$ across all relevant beneficiaries)	0		

### SUB-INDICATOR 2

2.1 Hectares of agricultural land

0

2.2 Hectares of urban landscape

800

2.3 Hectares of rural landscape

0

2.4 Hectares of forests

0

2.5 Hectares of marine area

0

2.6 Hectares of freshwater area

0

2.7 Number of residential houses

0

2.8 Number of public buildings

0

2.9 Number of irrigation or water structures

0

2.10 Number of fishery or aquaculture ponds or cages

0

2.11 Number of ports or landing sites

0

2.12 Km of road

0

2.13 Km of riverbank

0

2.14 Km of coast

0

2.15 Km of stormwater drainage

0

2.16 Number of new adaptation technologies supported

0

### **SUB INDICATOR 3**

3.1 Number of policies/plans developed and strengthened that will mainstream climate resilience

2

3.2 Number of systems and frameworks established for continuous monitoring, reporting and review of climate adaptation impacts

0

3.3 Number of national climate policies and plans enabled, including national adaptation planning processes

1

3.4 Number of institutional partnerships or coordination mechanisms established or strengthened

0

3.5 Number of institutions with increased capacity to plan, implement, monitor, and report for climate adaptation

0

3.6 Number of institutions with increased capacity to attract, and manage climate adaptation finance

0

3.7 Number of local community organizations benefitting from and/or engaged in institution strengthening, partnerships, or financing

0

3.8. Number of climate risk and vulnerability assessments conducted

0

#### SUB INDICATOR 4

4.1 Number of people trained or made aware of climate change impacts and appropriate adaptation responses	Total	Male	Female
a) National government	140	70	70
b) Local government	60	30	30
c) Local community organizations	0	0	0
d) Extension services	0	0	0
e) Hydromet and disaster risk management agencies	0	0	0
f) School children, university students, and teachers	0	0	0
g) Youth	0	0	0

#### SUB INDICATOR 5

	Total	Male	Female
5.1 Amount of investment mobilized (US\$) from private sector sources	0		
5.2 Number of entrepreneurs supported for climate adaptation or resilience	2	1	1
5.3 Total financial value of lines of credit and/or investment funds	0		
5.4 Number of MSMEs incubated/accelerated with technical assistance, financial matchmaking, and/or direct financing	0		

## Key Risks



	Rating	Explanation of risk and mitigation measures
CONTEXT		
Climate	Low	Extreme weather events during the implementation of the project may lead to extended project duration and cost overrun. Mitigation Strategies: To address the risk of project delays and cost increases from extreme weather events, the project will conduct risk assessments, early forecasting and develop contingency plans, in case of such events. The implementation team will carefully plan the timeline, with built-in buffers.
Environmental and Social	Moderate	<p>-Rights of affected populations (particularly of marginalized groups) are adversely impacted by project interventions and outcomes and do not have the possibility or capacity to claim their rights or meaningful participation. Mitigation Strategies: Implement a gender and stakeholders engagement action plans. Enforce project specific Grievance Redressal Mechanism. -Unintended gender biases could potentially discriminate against women limiting or adversely impacting their possibilities for accessing opportunities (including engagement in project activities) and/or influence on project interventions and outcomes. Mitigation Strategies: The project will adopt a gender-based approach to analyze the vulnerability, special capacities and needs of both women and men. It will also promote gender equality principles. A GAAP, aligned with current GEF/UNDP guidelines, will be implemented to ensure gender equality and mainstreaming of women is carried out throughout the project. -Due to the engagement of external contractors/influx of workers to the project area, there is a potential that this may exacerbate risks leading to GBV/SEAH. Mitigation Strategies: The project will adopt measures pertaining to providing awareness and capacity building training programs on GBV to the community, internal staff working on the project and Contractors once onboarded for the Project. A Code of Conduct would be prepared and shared with the Contractor once onboarded to ensure that elements of GBV/SEAH is well understood and adhered to by all workers during their engagement. Further, the GRM set up for the project would also provide entry points for GBV grievances to be registered and addressed. -Vulnerable population and urban poor in the project area are not sufficiently involved in the project stakeholder engagement processes and will not benefit from project interventions and outcomes as could be expected. Mitigation Strategies: Through the implementation of SEP and GRM, transparency and disclosure of the Project's activities to all stakeholders in compliance with Free Prior Informed Consent (FPIC) principles would be ensured. -There is a risk of disturbing the existing landscape and landmarks (cultural sites) while initiating Nature-based solutions and other on-the-ground interventions. Mitigation strategies: A site -specific broad level Social and Environment Screening Procedure will be developed by the Project and approved by the PMU and UNDP SES Specialist during the first six months of project implementation in collaboration with the Government counterparts to ensure the requirements of UNDP SES are met. Based on the screening process, in case of any potential risks of 'chance find', the Chance Find Procedure, is to be developed by the</p>

		Contractor for the specific site, approved by the PMU and thereafter, implemented onsite. The requirement of development of ‘Chance Find’ Procedure would be mentioned within the Contract Agreement of the Contractors.
Political and Governance	Low	Possible turnover in government staff and lack of continuity in the project implementation. Mitigation strategies: Maintain continuous communication with pertinent authorities at the regional, national, subnational and local levels. When there are changes in the authorities, inform about project progress and provide relevant handover information.

#### INNOVATION

Institutional and Policy	Moderate	Lack of buy-in from institutions and devolvement of authority to local governments and urban planning institutions. Mitigation strategies: At both national and regional level, the political and strategic frameworks are supportive of the Program objectives. The Stakeholder Engagement Plan will ensure ownership from local authorities and consider their respective operational contexts. Factual information to support sound analysis and decision-making.
Technological	Low	Slow buy-in and adoption of innovative solutions and technical skills by project stakeholders. Mitigation strategies: To address the risk of slow buy-in and adoption of innovative solutions and technical skills by project stakeholders, the project will prioritize early engagement to enhance stakeholder understanding. Additionally, extensive promotion of the solutions and skills through various communication channels will be conducted. Moreover, capacity-building and training programmes will be organized for the project stakeholders
Financial and Business Model	Low	The financial and business model risk of the project is low, cofinance is secured and the project results are mainstreamed within respected government budgets.

#### EXECUTION

Capacity	Moderate	<ul style="list-style-type: none"> <li>- Limited capacity of local institutions may hinder implementation of some activities. Mitigation strategies: To address the risk of limited capacity of local institutions hindering implementation, the project will provide early on capacity-building programmes such as training, workshops, and seminars to enhance their skills and knowledge. Fostering close partnerships between local institutions and the PMU will further strengthen their capacity and ensure successful implementation of some activities, e.g. they will collaborate during the planning, design, implementation and evaluation of project’s physical interventions.</li> <li>- Staff turn-over/attrition in the implementing agencies may hamper project execution. Mitigation strategies: To mitigate the risk of staff turnover/attrition in the implementing agencies impacting project execution, the project will implement succession planning of human resources within the PMU and other lead partners. Knowledge transfer within the PMU and sharing implementation responsibilities with other stakeholders will ensure continuity</li> </ul>
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		and effective management of project activities, in the face of potential staff turnover.
Fiduciary	Moderate	Price escalation due to inflation may exceed budgeted costs, affecting project achievements. Mitigation strategies: To mitigate the risk of price escalation due to inflation, the PMU will be preparing thorough cost estimations inclusive of inflation, which will be regularly updated. As another option, the PMU can negotiate fixed-price contracts with suppliers and contractors to lock in costs. Regular monitoring of market trends and adjusting budget allocations accordingly can help mitigate the impact of price fluctuations.
Stakeholder	Moderate	-Limited stakeholder participation resulting in ineffective or unsustainable project outcomes. Mitigation strategies: To mitigate the risk of inadequate stakeholder participation and ensure effective project outcomes, the project will prioritize early engagement of relevant stakeholders and foster inclusive involvement throughout the project cycle. Furthermore, utilizing websites, social and paper media, along with collaborating with CSOs to reach communities and vulnerable groups, will enhance civic participation. -Under developed private sector and weak value and supply chains may hinder adoption and success of private sector engagements. Mitigation strategies: To mitigate the risk of underdeveloped private sector and weak value and supply chains hindering the success of private sector engagements, the project will utilize Government Executive Order no. C-2/2024/6, which calls for actionable recommendations to address existing regulatory barriers. Through discussions among relevant departments and completion of consultation meetings, this process will streamline the regulatory framework, fostering a conducive environment for private sector involvement.
Other		
Overall Risk Rating	Moderate	The overall risk rating of the project, synthesized from the thematic risk categories above is Moderate

### C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Explain how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this. (max. 500 words, approximately 1 page)

The project is in alignment with the GEF 8 Programming Directions (GEF/R.08/29/Rev.01), and the LDCF Programming Strategy on Adaptation to Climate Change (GEF/LDCF.SCCF.32/04/Rev.01) and GEF-8 Strategy Alignment.

Importantly, the project is aligned with LDCF CCA priority areas and their respective entry points, namely:

Priority Area 1 Scaling Up Finance, with entry points: a) Reinforcing Policy Coherence, b) Strengthening institutional capacity, c) Supporting innovative financing mechanisms and instruments, d) Enhancing tools and metrics as enablers for adaptation impact

- Output 1.1 aims to strengthen overall cross-institutional policy coherence and capacity across various levels of government by fostering collaboration among multiple ministries and agencies. The Technical Advisory Consultative Committee (TACC) will further support this effort by providing guidance on integrating climate adaptation insights into sector-specific policies.
- Output 1.2 delivers downscaled vulnerability data, climate impact assessments, and hazard maps, while also enhancing a multi-dimensional climate and geospatial information system, serving as a reliable and accessible source with climate related data, models, and analytical tools.
- Output 1.5 focuses on innovative financing, piloting payments for ecosystems (PES), private public partnerships (PPP), taxation models, blended finance, crowdfunding, results-based budgeting through ecological transfers, and green bonds or other instruments to strengthen urban resilience. This output will also provide technical assistance to governments and financial institutions, emphasizing the integration of climate risk into budgeting processes, increasing private sector engagement, and promoting the use of green financing instruments.

Priority Area 2: Strengthening Innovation and Private Sector Engagement, with entry points: a) Advancing Technology Transfer, Innovation, and Deployment, b) Enabling the Conditions for Private Sector Action, c) Using Grant Finance to Share Risk and Catalyze Private Sector Investment, d) Incubating and Accelerating Micro, Small, and Medium Enterprises

- Output 1.3 implement NbS accelerator programme, in partnership with local with leading innovation actors, including universities, and start-up companies, offering training, and mentorship, incubation spaces, networking and business development support. Also, some of the successful initiatives will be piloted, upon completion of the programme. Also, the same output will develop localised strategy for involvement of private sector (investment and entrepreneurs) in implementation of NbS and other adaptation actions building on previous programs like Basic Entrepreneurship Training, ToT programs, and support from Startup Centers. Additionally, the program will upskill relevant officials in NbS entrepreneurship competencies and enhance accelerator programs targeting community initiatives, youth, women, and vulnerable populations, ensuring their participation in decision-making opportunities.
- Output 1.5 delivers training to financial institutions on climate stress testing, NbS financing, and environmental and social risk management (ESRM). This training supports the development of private sector-oriented financial mechanisms for urban resilience projects.

- Output 3.1 provides a venue for knowledge sharing and transfer, including exchange programme for public and private sector representatives from other thromdes, and support to development of localised replication action plans.

Priority Area 3 Fostering Partnership for Inclusion and Whole-of-Society Approach, with entry points: a) Focusing on Institutional Strengthening and Capacity Building Efforts at All Levels, b) Building Partnerships with Local Organizations and Systems to Address Social Equity, c) Engaging in Thought Leadership Through Global Partnerships and Fostering Enabling Environment

- Output 1.3 develops local climate-resilient and gender-responsive adaptation plans for Thimphu and Paro through a highly participatory approach, engaging institutions, civil society, the private sector, experts, and citizens. This output will also develop gender-responsive and inclusive community development plans for Nature-based Solutions (NbS), targeting neighborhood level. Both the local-level and community-level plans place a strong emphasis on inclusion of socially disadvantaged groups.
- Output 1.4 enhances the technical capacity of the workforce from institutional and private sectors directly involved in implementing urban resilience measures. It also incorporates climate resilience into educational and training programs for future urban planners, engineers, technicians, and construction workers.
- Output 3.1 fosters collaboration and engagement with globally recognized organizations and initiatives focused on climate resilience by promoting project results and knowledge products and attendance of relevant events.

The project's interventions are centred around programming themes i.e. Water (Theme 2) and NbS (Theme 3) and EWS and climate information systems (Theme 4). Component 1 will enhance climate risk-informed urban planning through enhancing capacities at multiple institutional levels at national and local scales, including enhancing information systems (GIS, EWS) for climate-informed decision-making in the face of water hazards. Component 2 is centred around NbS and hybrid infrastructure in urban and peri-urban areas to enhance flood management and protection ecosystem services provided by permeable and vegetated surfaces in Thimphu and Paro.

Moreover, the project addresses the LDCF's transformation levers in Component 1 and 3 (policy coherence and climate adaptation mainstreaming; strengthened governance for adaptation; knowledge exchange and collaboration) through mainstreaming climate adaptation and nature-based solutions in urban planning at a government and local level, to transform urban and spatial planning in Bhutan's cities. The project outputs are aligned with the Theory of Change outputs and outcomes.

Additionally, the project addresses cross-cutting themes from the GEF-8 Theory of Change (GEF/R.08/28), including gender-responsive approaches, nature-based solutions (NbS), resilience and private sector engagement. Nature-based solutions are central to this project, as Component 2 is dedicated entirely in

integrating them in Thimphu and Paro to reduce surface run-off and increase permeability of surfaces to increase resilience against climate change-induced hazards. Private sector engagement is envisioned under Output 1.3 and 1.5 and is also linked to the theme of NbS. The project will promote the rights, participation, and benefits of local vulnerable urban communities, women, and youth, integrating these focuses throughout the project (particularly Component 1), beyond the basic requirements of safeguard systems.

Lastly, the project is also aligned with the strategic entry points of the GEF's Sustainable Cities IP, even if it is a standalone project. The project will advance integrated and systems-based interventions, through strengthening people's engagement and spatial and institutional integration in planning in Component 1, with a regional perspective across Thimphu and Paro. The project also integrates nature-based approaches in urban development and regional planning, with planned interventions in peri-urban areas and acknowledging surrounding ecosystems as vital to providing flood management ecosystem services.

### **Alignment with national policies and strategies**

The project aligns with multiple national climate change plans and policies, namely Bhutan's Climate Change Policy (2020), Bhutan's National Adaptation Plan (2023) and Long term Low GHG emission and Climate Resilience Development Strategy (2023). The project achieves this through improved water management, strengthening disaster risk reduction, promoting climate-resilient and nature-based infrastructure and sustainable human settlements.

Similarly, the project complements Bhutan environment and biodiversity plans, such as Bhutan's National biodiversity Strategy and Action Plan (NBSAP 2014), through the protection of key ecosystem services for human well-being (Target 14) and strengthening adaptation measures for potential impacts of climate change on ecosystems (Target 10).

## **D. POLICY REQUIREMENTS**

### **Gender Equality and Women's Empowerment**

**We confirm that gender dimensions relevant to the project have been addressed during Project Preparation as per GEF Policy and are clearly articulated in the Project Description (Section B).**

Yes

**1) Does the project expect to include any gender-responsive-measures to address gender gaps or promote gender equality and women's empowerment?**

Yes

If the project expects to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment, please indicate in which results area(s) the project is expected to contribute to gender equality:

**Closing gender gaps in access to and control over natural resources;**

**Improving women's participation and decision-making; and/or**

Yes

## Generating socio-economic benefits or services for women.

Yes

## 2) Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

### Stakeholder Engagement

We confirm that key stakeholders were consulted during Project Preparation as required per GEF policy, their relevant roles to project outcomes has been clearly articulated in the Project Description (Section B) and that a Stakeholder Engagement Plan has been developed before CEO endorsement.

Yes

### Select what role civil society will play in the Project

Consulted only; Yes

Member of Advisory Body; Contractor; Yes

Co-financier;

Member of project steering committee or equivalent decision-making body ;

Executor or co-executor;

Other (Please explain)

### Private Sector

Will there be private sector engagement in the project?

Yes

And if so, has its role been described and justified in section B project description?

Yes

### Environmental and Social Safeguards

We confirm that we have provided information regarding Environmental and Social risks associated with the proposed project or program, including risk screenings/ assessments and, if applicable, management plans or other measures to address identified risks and impacts (this information should be presented in Annex E).

Yes

Please provide overall Project/Program Risk Classification

### Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
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Medium/Moderate	Medium/Moderate		
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## E. OTHER REQUIREMENTS

### Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described during Project Preparation in the Project Description and that these activities have been budgeted and an anticipated timeline for delivery of relevant outputs has been provided.

Yes

### Socio-economic Benefits

We confirm that the project design has considered socio-economic benefits to be delivered by the project and these have been clearly described in the Project Description and will be monitored and reported on during project implementation (at MTR and TER).

Yes, this is confirmed. Please refer to Annex 24 to the ProDoc (Socio-economic Analysis). It has been uploaded to the Roadmap Section.

## ANNEX A: FINANCING TABLES

### GEF Financing Table

#### Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant(\$)	Agency Fee(\$)	Total GEF Financing (\$)
UNDP	LDCF	Bhutan	Climate Change	LDCF Country allocation	Grant	18,048,624.00	1,624,376.00	19,673,000.00
<b>Total GEF Resources (\$)</b>						<b>18,048,624.00</b>	<b>1,624,376.00</b>	<b>19,673,000.00</b>

### Project Preparation Grant (PPG)

Was a Project Preparation Grant requested?

true

PPG Amount (\$)

300000

PPG Agency Fee (\$)

27000

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	PPG(\$)	Agency Fee(\$)	Total PPG Funding(\$)
UNDP	LDCF	Bhutan	Climate Change	LDCF Country allocation	300,000.00	27,000.00	327,000.00
<b>Total PPG Amount (\$)</b>					<b>300,000.00</b>	<b>27,000.00</b>	<b>327,000.00</b>

Please provide Justification

#### Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total(\$)
<b>Total GEF Resources</b>					<b>0.00</b>

#### Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing(\$)	Co-financing(\$)
CCA-1-1	LDCF	18,048,624.00	62186000
<b>Total Project Cost</b>		<b>18,048,624.00</b>	<b>62,186,000.00</b>

#### Confirmed Co-financing for the project, by name and type

Please include evidence for each co-financing source for this project in the tab of the portal

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Ministry of Finance	Grant	Investment mobilized	34919000
Recipient Country Government	Ministry of Finance	In-kind	Recurrent expenditures	27192000
GEF Agency	UNDP	Grant	Investment mobilized	75000
<b>Total Co-financing</b>				<b>62,186,000.00</b>

Please describe the investment mobilized portion of the co-financing

The total amount of co-financing for the project increased to USD 62,111,000 and will be derived through investment mobilized and in-kind co-financing types. Out of the total co-financing, USD 34,919,000 of this co-financing comes from Investment

mobilized categories. “Investment Mobilized”. The remaining would be in the form of recurrent expenditures to support the successful implementation of the project.

These mobilized investments are from the current (or planned) projects implemented/to be implemented in Bhutan that support the overall objectives of the ECRUL Project. UNDP will also provide USD 75,000 in co-financing towards the project management cost. The details of these investments mobilized co-financing along with the co-financing letters are secured and submitted as a part of the CEO Endorsement Package.

The co-financing ratio increased to 1 to 3.3. This will be monitored during the project implementation and will work with project partners to mobilise additional resources.

## ANNEX B: ENDORSEMENTS

### GEF Agency(ies) Certification

GEF Agency Type	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	6/25/2023	Nancy Bennet (Ad Interim)	12129065044	nancy.bennet@undp.org
Project Coordinator	6/25/2024	Aishath Azza	61423597422	aishath.azza@undp.org

### Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

Please attach the Operational Focal Point endorsement letter(s) with this template.

Name of GEF OFP	Position	Ministry	Date (MM/DD/YYYY)
Loday Tsheten	Director	Department of Macro-Fiscal and Development Finance, Ministry of Finance	3/20/2023

## ANNEX C: PROJECT RESULTS FRAMEWORK

Please indicate the page number in the Project Document where the project results and M&E frameworks can be found. Please also paste below the Project Results Framework from the Agency document.

<b>Contribution to the Sustainable Development Goal (s):</b> SDG 11- making cities and human settlements inclusive, safe, resilient and sustainable, and SDG 13- taking urgent action to combat climate change and its impacts. The cross-cutting SDGs are SDG 5 - Gender equality and women's empowerment, SDG 15 -Biodiversity, forests, desertification and SDG 3 - Good health by a reduction in waterborne diseases.
<b>Intended Outcome as stated in the UNSDCF/Country Programme Results and Resource Framework:</b>
<i>UNSDCF outcome 3 and UNDP CPD outcome 2: By 2028, Bhutan's environment remains sustainably managed, and its people are more resilient to disaster risks and climate change</i>
<b>Applicable Output(s) from the UNDP Strategic Plan:</b> 3.1, 4.1

<b>Project title and Quantum Project Number:</b> Enhancing the Climate Resilience of Urban Landscapes and Communities in Thimphu-Paro region of Bhutan (ECRUL)							
	Objective and Outcome Indicators (no more than a total of 20 indicators)	Data Source	Baseline	Mid-term Target	End of Project Target	Data Collection Methods	Risks/Assumptions
<b>Project</b>	<i>To strengthen the management of climate risks, and reduce the vulnerability of urban landscapes and communities to the impacts of climate change in Thimphu-Paro.</i>						
<b>Objective:</b>	<b>Mandatory Indicator</b> 1: # direct project beneficiaries disaggregated by gender (individual people)	Population & Housing Census of Bhutan	0	Total: 36,575 Male: 18,287 Female: 18,288	Total: 146,298 Male: 75,211 Female: 71,087	Population & Housing Census of Bhutan  Beneficiary Sample Survey	Risks: None  Assumption: Project is timely implemented as planned
	<b>Mandatory Indicator</b> 2: # (a) Area of land managed for climate resilience (ha)	DHS / DECC	0	150	800 ha	GIS / remote sensing  Site visits	Risks: None  Assumption: Project Implementers adopt the climate resilient approaches
	<b>Mandatory Indicator</b> 3: # Number of gender responsive policies/plans/frameworks/institutions to strengthen climate adaptation	DHS / DECC	0	2	3	Official endorsement documents	Risks: None  Assumption: Information and acceptance of policies, plans, frameworks, and institutions for climate adaptation is readily available, relevant and adopted with a high level of ownership.
	<b>Mandatory Indicator</b> 4: # Number of people trained or with awareness raised	DHS (PMU)	0	Total=40 Male: 20 Female: 20	Total=200 Male: 100 Female: 100	Training certificates	Risks: None  Assumptions: Communities and stakeholders and beneficiaries are receptive to and understand the urgency and uptake of climate actions.
	<b>Mandatory indicator</b> 5: # Number of women led private sector enterprises engaged in climate change adaptation and resilient actions	DoEE / MoICE	0	1	2	Signed cooperation agreements	Risks: None  Assumption: Private Enterprises are willing to engage in the climate adaptation and resilience actions
<b>Project component 1</b>	<i>Climate risk-informed, coordinated, and inclusive planning and governance for resilient urban development</i>						

<b>Project Outcome 1</b> (Outcome 1: Institutional coordination, stakeholder engagement and climate adaptation capacity strengthened for inclusive and-resilient urban planning and development)	<i>Indicator 6: Number of local gender-responsive adaptation plans developed</i>	DECC	0	1	2	Plans endorsement	Risks: None  Assumptions: Gender responsive adaptation plans are adopted with a high level of ownership.
<b>Outputs to achieve Outcome 1</b>	<p><i>Output 1.1: Inter-agency mandates and functions harmonized, and institutional coordination mechanisms established and made functional to facilitate policy coherence for climate-resilient urban planning and development</i></p> <p><i>Output 1.2: Climate and geospatial information systems established with trained urban planners to promote risk informed urban planning</i></p> <p><i>Output 1.3: Climate-resilient and gender-responsive adaptation plans prepared for Thimphu and Paro with active citizen participation and added emphasis on climate resilient entrepreneurship</i></p> <p><i>Output 1.4: Educational and training programs introduced in colleges and technical schools for skilling, reskilling and upskilling of planning professionals and workforce</i></p> <p><i>Output 1.5: Innovative financing solutions for public and private sector to invest in climate-resilient projects, technologies and services</i></p>						
<b>Project component 2</b>	<i>Build Resilience through gender-responsive climate adaptive approaches</i>						
<b>Project Outcome 2</b> (Outcome 2: Climate risk management measures designed and implemented for water management systems and urban infrastructure)	<i>Indicator 7: Length of water corridors climate-proofed through NbS to protect people, assets and businesses:</i>  a) m for riverside  b) m for streams  c) m for drainage	DHS	0	90018.6 km  11.934.3 km  1.164 km	30.062 km  39.781 km  3.880 km	GIS/Remote sensing  Field visits	Risks: None  Assumptions: All adaptive project measures are designed through an incorporation of climate rationale and resilient features
	<i>Indicator 8: Area of land developed for climate adaptation</i>  a) urban forests and green spaces  b) springsheds and watersheds	DHS / DOFPS / DOW	0	a) 19 ha b) 150 ha	a) 99 ha b) 800 ha	GIS remote sensing  Site visits	Risks: None  Assumptions: Areas identified in the Green infrastructure and open space master plan are brought under climate adaptation
	<i>Indicator 9: Number of technologies introduced and tested for climate-risk informed decision-making</i>	DHS / NCHM / DOW / DOID	0  0  0	1  0  2	2  3  4	Site visits	Risks: None  Assumptions: There is a conducive policy environment, technologies are efficiently functional and project

	<p>a) digitalisation of water management systems</p> <p>b) green and climate-resilient interventions incorporated in demonstration buildings</p> <p>c) weather and climate monitoring stations</p>						implementers apply the capacity acquired to execute the technologies
Outputs to achieve Outcome 2	<p>Output 2.1: Climate-proofing features for the key sections of the water and stormwater management systems introduced to ensure flood risk management, safe and uninterrupted water supply and business continuity in critical urban areas</p> <p>Output 2.2: Ecosystem and NbS developed and implemented to adapt to floods, heat-island effect, and landslide and to enrich water sources, natural streams and catchments for improved infiltration, restoration and recharge</p> <p>Output 2.3: Measures to increase climate resilience of buildings and design of urban spaces introduced</p> <p>Output 2.4: Ancillary rainfall threshold-based flood EWS developed on critical tributaries and integrated with the existing centralized hydro-met data management system (CDMS) of NCHM</p>						
Project component 3	Knowledge management, gender-responsive monitoring and evaluation						
Outcome 3 (Outcome 3: Gender responsive knowledge and communication products developed and platforms instituted to analyse and disseminate best practices and project lesson)	Indicator 10: Number of gender responsive knowledge products generated and disseminated	PMU	0	10	20	Project records / publication	Risks: None Assumption: The project generates best practices and document lessons learnt for dissemination on Project KM
	Indicator 11 Number of people sensitized and informed about urban resilience and NbS through ECRUL communication and dissemination activities	DHS	0	30,000	120,000	Website and social media visitors, publications distributed, consultation meetings and workshops attendance, broadcasting service survey (for mainstream media)  KAP survey	Risks: None Assumption: Communities, stakeholders and beneficiaries are receptive to and understand the urgency and uptake of climate actions
	Indicator 12 Level of knowledge, awareness and perception (KAP) of urban communities and beneficiaries	PMU	Baseline	5% score increase compared to Baseline	15% score increase compared to Baseline	KAP survey reports	Risks: None Assumption: Communities, and stakeholders and beneficiaries are receptive to and understand the urgency and uptake of climate actions
Outputs to achieve Outcome 3	<p>Output 3.1: Knowledge and communication products and platforms developed to analyse and disseminate best practices and project lessons</p> <p>Output 3.2: Project progress and results are effectively tracked and managed through monitoring and evaluation</p>						

	<i>Indicator 13: Number of Mid-term reviews and Final Evaluation completed on time and scored marginally satisfactory or above</i>	<i>MUS</i>	<i>0 Mid- term evaluatio ns</i>  <i>0 Final evaluatio ns</i>	<i>1 Mid term evaluatio n rated MUS or above</i>  <i>0 Final evaluatio n</i>	<i>1 Mid term evaluatio n rated MUS or above</i>  <i>1 Final evaluatio n rated MUS or above</i>	<i>Risks: None</i>  <i>Assumption : Project implemented respecting timeline Willingness of participating institutions to participate in interviews and provide relevant data to the evaluation teams.</i>
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#### ANNEX D: STATUS OF UTILIZATION OF PROJECT PREPARATION GRANT (PPG)

Provide detailed funding amount of the PPG activities financing status in the table below:

Project Preparation Activities Implemented	GETF/LDCF/SCCF Amount (\$)		
	Budgeted Amount	Amount Spent To date	Amount Committed
Contractual Services - Individual	10,000.00	5,330.32	4,669.68
Travel	20,000.00	1,332.67	18,667.33
Contractual Services-Companies	224,000.00	188,650.00	35,350.00
Training, Workshops and Conference	40,000.00	5,104.49	34,895.51
Supplies – materials for stakeholder consultations	6,000.00	35.73	5,964.27
<b>Total</b>	<b>300,000.00</b>	<b>200,453.21</b>	<b>99,546.79</b>

#### ANNEX E: PROJECT MAP AND COORDINATES

Please provide geo-referenced information and map where the project interventions will take place

Location Name	Latitude	Longitude	GeoName ID
Thimphu	27.4716	89.6386	

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Paro	27.4287	89.4164	



Location Description:

Activity Description:

Please provide any further geo-referenced information and map where project interventions are taking place as appropriate.

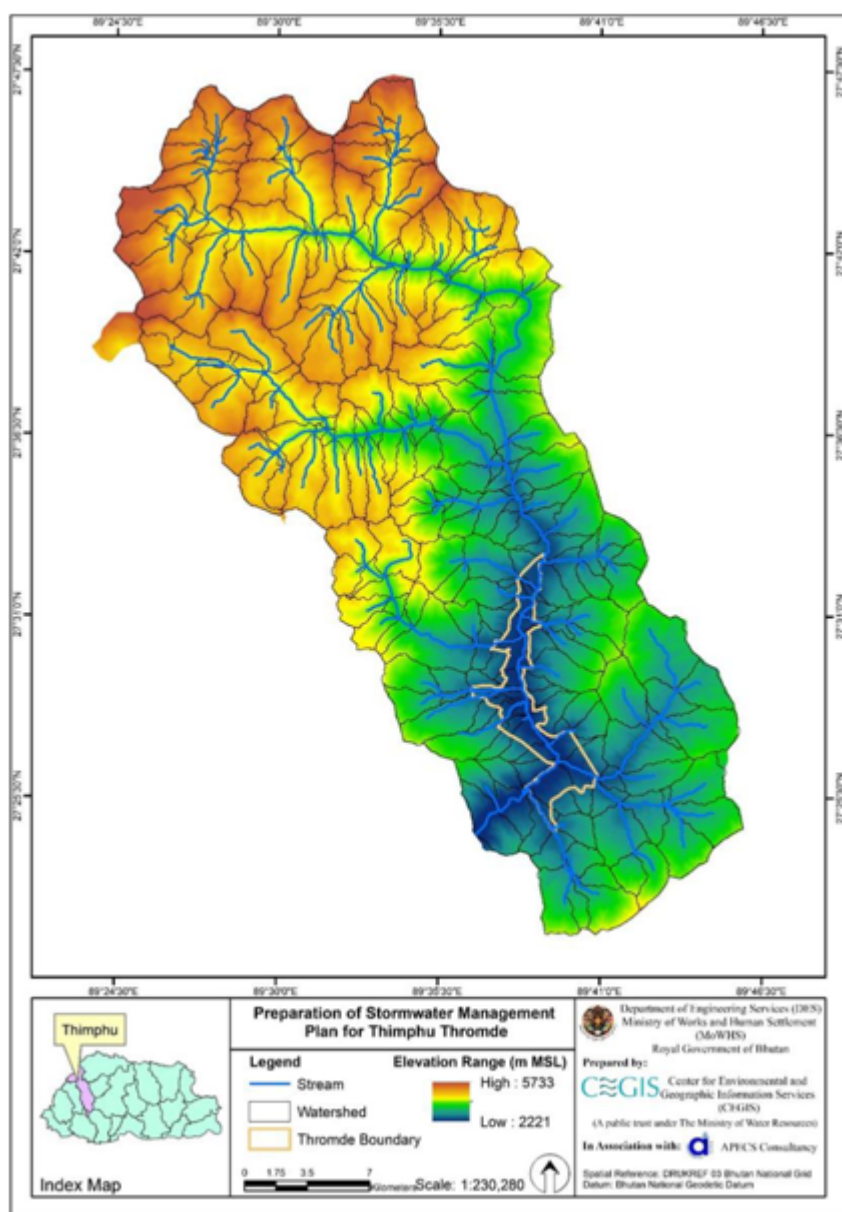


FIGURE 1 THIMPHU

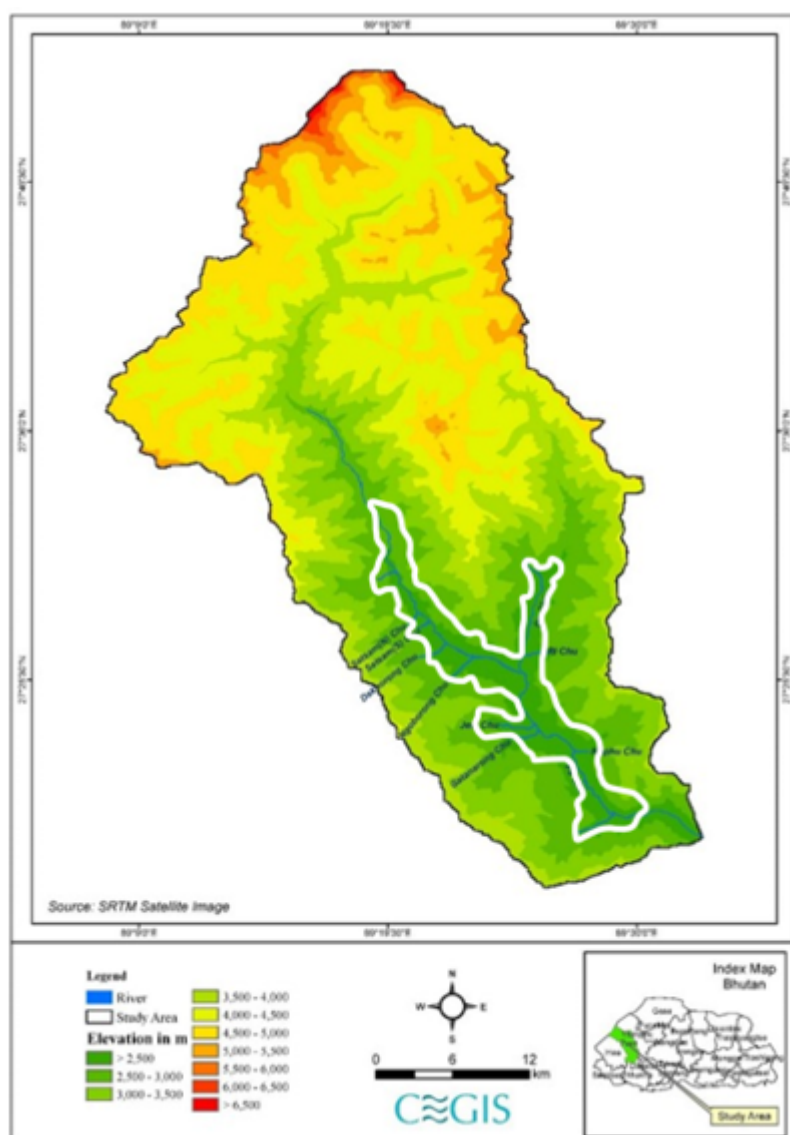


FIGURE 2 PARO

## ANNEX F: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

Attach agency safeguard datasheet/assessment report(s), including ratings of risk types and overall project/program risk classification as well as any management plans or measures to address identified risks and impacts (as applicable).

Title

Annex 08 Stakeholder Engagement Plan\_9Oct

11109\_ProdocAnnex10\_Gender Analysis and Gender Action Plan

11109\_Prodocannex9Grievance Redress Mechanism

11109\_Prodocannex8Stakeholder Engagement Plan

11109\_SESP\_Bhutan

## ANNEX G: BUDGET TABLE

Please upload the budget table here.

## ANNEX G: BUDGET TABLE

Please upload the budget table here\*

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
Equipment	Output 1.2 Equipment supply: USD 80,000	80,000.00	-		80,000.00			80,000.00	MoIT
Equipment	Output 1.3 Gender responsive and inclusive action plans: print materials and supplies for the gender responsive plans: USD 40,000	40,000.00	-		40,000.00			40,000.00	MoIT
Equipment	Output 1.4 Equipment and furniture for the laboratories: USD 60,000	60,000.00	-		60,000.00			60,000.00	MoIT
Equipment	Output 1.4 Procurement of materials and goods for lab: USD 35,000	35,000.00	-		35,000.00			35,000.00	MoIT
Equipment	Output 1.5 Procurement/ Equipment: high spec desktop and computers for data processing and analysis, software and licenses: USD 15,000 Procurement/ Equipment: training materials, software and license for macro-economic modelling (MATLAB, Mathematica): USD 15,000 Goods / equipment for training: USD 16,250 Procurement/ Equipment: USD 15,000	61,250.00	-		61,250.00			61,250.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
Equipment	Output 2.1 IT Equipment: USD 14,375	-	14,375.00		14,375.00			14,375.00	MoIT
Equipment	Output 2.1 Procurement of Goods and Services :USD 28,500 Procurement of equipment to implement the Non Revenue Water remedial measures: USD 20,000	-	48,500.00		48,500.00			48,500.00	MoIT
Equipment	Output 2.2 Procurement plants and equipment for fire suppression: USD 15,000 Procurement of weather stations and flow probes: USD 43,000	-	58,000.00		58,000.00			58,000.00	MoIT
Equipment	Output 2.4 Materials and Goods for EWS modelling, system hosting and operation: USD 60,000 Water level stations (sensors, data logger, communication modem) for setting up automatic river gauging stations: USD 155,000 Weather monitoring equipment (sensors, data logger, communication modem) for setting up automatic weather stations: USD 170,000 Rehabilitation of two existing stations (1 Paro, 1 Thimphu): USD 20,000	-	405,000.00		405,000.00			405,000.00	MoIT
Equipment	Output 3.1 Goods and materials: 65,000 USD	-	-	65,000.00	65,000.00			65,000.00	MoIT
Equipment	Output NIM PMC Audiovisual equipment: USD 11,906	-	-		-		11,906.00	11,906.00	MoIT
Equipment	Output NIM PMC IT equipment: USD 20,140	-	-		-		20,140.00	20,140.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
Contractual services- Individual	Output NIM PMC Project officer / technical expert: USD 143,520 Project gender & safeguards officer / technical expert: USD 134,160 Project manager: USD 162,240 Project M&E / comms officer: USD 134,160	-	-		-		574,080.00	574,080.00	MoIT
Contractual services- Company	Output 1.2 Consulting company -For development of system: USD 40,000 - For enhancement of system: USD 40,000 - For data analysis: USD 50,000  Tuition fee: USD 52,000	182,000.00	-		182,000.00			182,000.00	MoIT
Contractual services- Company	Output 1.3 Tuition fee: USD 14,400 Training for upskilling of NbS entrepreneurship - tuition fees: USD 75,000 Equipment support and business development services: approx. 26,200 per entrepreneur, 21 entrepreneurs: USD 560,000	649,400.00	-		649,400.00			649,400.00	MoIT
Contractual services- Company	Output 1.4 Professional training for building capacity of the staff at CST USD 12,915 Procurement of study material to equip the programmes and computer software to deliver the modules: USD 25,000 Development of lab for urban climate resilience related modules (2 labs): USD 140,000 Companies to develop state-of-the art prototype development for students: USD 40,000 Contractual services (tuition fee): USD 198,420	416,335.00	-		416,335.00			416,335.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
Contractual services- Company	<p>Output 2.1 Local consulting firm will lead the task with the condition to hire International consultant: USD 58,875 Meetings and workshops for In-house survey and design, estimate and tendering works: 25,100 USD</p> <p>Contractual services-companies -For implementation of Nbs integrated storm water interventions: USD 50,000</p> <p>-To rehabilitate pry. Stormwater drainage system/networks: USD 1,192,000 -To rehabilitate secondary stormwater drainage system/networks: USD 1,495,000 -For construction of lateral drainage system/networks: USD 454,000 -To stormwater drainage system/networks in Debsi LAP: USD 77,900 -For Installation of sensors and SCADA system: USD 136,500 -To construct climate resilient water supply infrastructure and NRW: USD 970,000</p> <p>National contractor (works) - for implementation of flood safety measures primary stormwater drainage system and streams in Thimphu: USD 273,000</p>	-	4,732,375.00		4,732,375.00			4,732,375.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
Contractual services-Company	<p>Output 2.2 International Consultancy firm for the Design of landscape with NBS and EBA solutions along Wangchhu River: USD 150,000</p> <p>Contractual services-companies, to implement the Design to enhance wangchu river corridor: USD 840,000</p> <p>Companies for Creation and maintenance of fireline (6km) and development of Nbs reservoirs/ponds in high fire prone and sensitive areas): USD 57,000</p> <p>Local Consulting Firm for Survey and Designs: USD 20,000</p> <p>Contractual services-companies, for engagement in construction and procurement of goods and materials: USD 350,000</p> <p>Contractual services-companies, for establishment of weather stations:USD 50,000</p> <p>Contractual Services (for implementation of Nbs in watersheds/springs heds): USD 340,000</p> <p>Local consulting firm- Dzongkhag integrated water master plan development: USD 93,500</p> <p>Local consultant firm (for detailed design and estimation of flood management safety measures based on the Flood Management Plan of Paro, 2020): USD 15,000</p> <p>Contractual</p>	-	4,731,625.00		4,731,625.00			4,731,625.00	MoIT



Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	services-companies, for implementation of flood safety measures in Paro: USD 2,100,000 Workshops: USD 18,375 Local Consultant Firm (to design the flood management safety measure along the Wangchhu river and its tributaries): USD 25,000 Contractual services-companies, to implement the flood safety measures in Thimphu: USD 672,750								
Contractual services-Company	Output 2.3 International consulting firm: USD 85,575 International consulting firm for development of tool/system + Procurement of international tools and documents etc for review and study: USD 41,500 Local consultant (Company) - may include JV of local and international: USD 98,700 International consulting firm for design of climate resilient building: USD 80,955 Contractual services-companies, to construct inclusive and climate resilient building for demonstration: USD 450,361 International consulting firm for design: USD 30,000 Contractual services-companies, to retrofit an existing public building with inclusive and climate resilient technology in Paro for demonstration: USD 289,625	-	1,076,716.00		1,076,716.00			1,076,716.00	MoIT

Expenditure Category	Detailed Description	Component (US\$Eq.)			Sub-Total	M&E	PMC	Total (US\$Eq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
Contractual services-Company	<p>Output 2.4 International Consultant to develop flood forecasting model: USD 30,000 International Consulting firm: USD 50,000</p> <p>Contractual services-Companies -To establish short-long term stream gauging stations with ambient water quality monitoring sensors: USD 64,000 - For establishment of Weather and climate monitoring station: USD 85,000 -To rehabilitate critical hydromet stations: USD 20,000</p>	-	249,000.00		249,000.00			249,000.00	MoIT
Contractual services-Company	<p>Output 3.1 Local IT consultancy Firms: USD 45,000 Contractual services for videographer and graphics designer: USD 65,000 Promotion of the project by broadcasting it in the national news: USD 25,000 Tuition fee: USD 26,400 Local Consultant (firm) for Survey: USD 30,000</p>	-	-	191,400.00	191,400.00			191,400.00	MoIT
International Consultants	Output 1.4 International Consultant to review the changed and new modules, to review the master programme: USD 25,000	25,000.00	-		25,000.00			25,000.00	MoIT
International Consultants	<p>Output 3.2, MTR &amp; TE International Consultant for independent Terminal Evaluation of GEF-financed and co-financed activities in line with UNDP/GEF requirements: USD 40,000</p> <p>International consultant for independent Mid-term Review of</p>	-	-		-	66,000.00		66,000.00	UNDP

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	GEF-financed and co-financed activities in line with UNDP/GEF requirements, and incorporate recommendations of MTR into revised project plans (management response) following PSC's approval): USD 26,000								
Local Consultants	Output 1.1 Item: Short term local consultant: USD 70,000	70,000.00	-		70,000.00			70,000.00	MoIT
Local Consultants	Output 1.2 Short term local consultant for enhancement of system and data analysis: USD 10,000	10,000.00	-		10,000.00			10,000.00	MoIT
Local Consultants	Output 1.3 National consultant to carry out vulnerability assessment/analyses: USD 54,000 National consultant to carry out gender assessment/analyses: USD 80,000 National consultant (individual): USD 13,500 Local consultant for the development of strategy for involvement of private sector: USD 20,000	167,500.00	-		167,500.00			167,500.00	MoIT
Local Consultants	Output 1.4 Local Consultant for review of existing educational and training programmes: USD 25,000 Local consultant to review the changed and new modules, and the master programme: USD 20,000  Local Consultant, for Evaluation of implemented programmes: USD 30,000  Local consultant Assessment of options for	95,000.00	-		95,000.00			95,000.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	permanent integration of training programmes in selected institutions: USD 20,000								
Local Consultants	Output 1.5 Local Consultant related to Output 1.5: USD 58,000 Local consultant for review and update PES Framework: USD 20,000 Local consultant - Feasibility study on water tariff: USD 30,000	108,000.00	-		108,000.00			108,000.00	MoIT
Local Consultants	Output 2.1 Local Consultants for the Design for stormwater drainage systems: USD 20,000 Local consultant (build data for the water distribution network for proper O&M): USD 10,000 Local consultant, for assessment of existing water supply networks and plants): USD 18,500 Local consultant for Output 2.1: USD 40,000	-	88,500.00		88,500.00			88,500.00	MoIT
Local Consultants	Output 3.1 Local Expert to prepare Plan and Strategy: USD 35,000	-	-	35,000.00	35,000.00			35,000.00	MoIT
Local Consultants	Output 3.2MTR & TE Local consultant to support MTR process: USD 13,500 and Terminal Evaluation : USD 20,000	-	-		-	33,500.00		33,500.00	UNDP
Training, Workshops, Meetings	Output 1.1 Workshop and Training: USD 20,470	20,470.00	-		20,470.00			20,470.00	MoIT
Training, Workshops, Meetings	Output 1.2 Workshops and training including facilitators: USD 154,900	154,900.00	-		154,900.00			154,900.00	MoIT
Training, Workshops, Meetings	Output 1.3 Consultation meetings/ workshop: USD 91,000	408,000.00	-		408,000.00			408,000.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	<p>Workshops and community engagement: USD 24,000</p> <p>Training and workshop-In-country and shareholder consultation: USD 13,000</p> <p>Workshops/meetings: USD 10,000</p> <p>Training on enhancing NbS for youth, women, vulnerable population: USD 150,000</p> <p>Workshops, awareness programs and promotional events: USD 120,000</p>								
Training, Workshops, Meetings	<p>Output 1.4 Workshop and Training: USD 50,430</p> <p>Y1 for PhD programme needs analysis, Y 2 for BE programme needs analysis, Y1 travel to 6 Dzongkhags for needs analysis survey and report: USD 5,400</p> <p>Training, workshops and travel for assessment and review of existing modules to incorporate climate/urban resilience component into existing modules Year1-5: USD 31,439</p> <p>Training, workshop and travel for the development of new modules as regular/elective modules, to develop and integrate new modules in the field of climate/urban resilience into existing programmes Year1-5: USD 40,000</p>	869,794.00	-		869,794.00			869,794.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	<p>Training, workshop and travel for the development programme for Master in Engineering by research to cater for topics related to climate/urban resilience Year1-2: USD 11,000</p> <p>Training - Ex-country: professional training for building capacity of the staff at CST to offer the modules and train professionals on climate/urban resilience Year1-4: USD 152,320</p> <p>Training and workshop - In-country: USD 20,000</p> <p>Training - In-country training/Online training to build HR capacity of the staff at CST on climate/urban resilience through in-country training and online training 3 trainings Year1-3: USD 32,000</p> <p>Training, workshops and travel build the capacity of officials from governments, private, CSOs in the climate/urban resilience component: 5 trainings Year 1-5: USD 50,000</p> <p>Training and Workshops/travel for lab related activities Year2-5: USD 20,000</p> <p>Training and workshop - In-country: USD40,000</p> <p>Training and workshop- Ex-country: USD219,800</p> <p>Trainings/workshops and study visits - ex-country: USD 127,680</p> <p>In-country Training/workshop: USD 32,325</p>								

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	Ex-country- capacity building of relevant officials on hydrological model development, data assimilation and system integration: USD 15,600 Ex-country- capacity building of relevant officials on weather data downscaling and integration into EWS: USD 11,800 Training for 100 people: USD 10,000								
Training, Workshops, Meetings	Output 1.5 Training/Workshop: USD 148,750 Consultation meetings and training of stakeholders: USD 50,000 Training and workshops - consultations and assessment: USD 50,000	248,750.00	-		248,750.00			248,750.00	MoIT
Training, Workshops, Meetings	Output 2.1 Workshop: USD 6,750 Meetings and workshops for in-house survey and design, estimate and tendering works: USD 7,000 Training/ Workshop (In country): USD 30,625	-	44,375.00		44,375.00			44,375.00	MoIT
Training, Workshops, Meetings	Output 2.2 Training/ Workshop (In country): USD 24,500 Consultation workshops with LGs and water users: USD 18,375 Training and Workshops: USD 12,250 Workshops/Meetings - Consultations with stakeholders: USD 18,375 Workshops: USD 12,250	-	85,750.00		85,750.00			85,750.00	MoIT
Training, Workshops, Meetings	Output 2.3 Stakeholder consultations, workshops, meetings: USD 19,625	-	19,625.00		19,625.00			19,625.00	MoIT
Training, Workshop	Output 2.4 Training/Workshop	-	30,000.00		30,000.00			30,000.00	MoIT



Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
ps, Meetings	s: 2 workshop, 5 day each: USD 21,000  Training/Workshops - SOP Development: 1 workshop, 1 day: USD 1,000 Training/Workshops - Public Consultation: USD 8,000								
Training, Workshops, Meetings	Output 3.1 Attending and presenting the project output and articles in conferences and seminars- In Country and Ex-country: USD 30,000 Organising Urban/Climate resilience International/national conference in country: USD 30,000 Meetings and Workshops: USD 78,300 Exchange programme for CST staff and students- in country and ex country: USD 86,600 Training and workshops: USD 25,000	-	-	249,900.00	249,900.00			249,900.00	MoIT
Training, Workshops, Meetings	Output 3.2 Annual implementation review of Gender Action Plan: USD 40,000 : Annual Planning and review workshop which includes plan preparation and monitoring of indicators in project results framework for adaptive management, annual lesson learning session among project stakeholders; Complete annual PIR and conduct mid-year review of annual work plan implementation status for adaptive	-	-		-	237,500.00		237,500.00	UNDP

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	management of project activities: USD 60,000 Baseline Survey and assessment as necessary to update all indicators in the results framework at mid-term and end of project: USD 20,500 Technical Advisory Committee meetings and sessions: USD 18,000 Annual implementation review of social and environment safeguards and GRM: USD 60,000 Field consultations and meetings related to MTR: USD 19,500 Field consultations and meetings related to Terminal Evaluation: USD 19,500								
Training, Workshops, Meetings	Output NIM PMC, Convene project inception workshop within first 60 days of the project to review, update and elaborate project plans and management arrangements. + Miscellaneous Meetings (review and coordination meetings, technical advisory meetings), site/field mission visits and communications: USD 94,332 SC sessions: USD 33,000	-	-		-		127,332.00	127,332.00	MoIT
Travel	Output 1.1 Travel: 30 people*\$39*3 days: USD 10,530	10,530.00	-		10,530.00			10,530.00	MoIT
Travel	Output 1.2 Travel for 30 people: USD 55,700  Output 1.2: 1) through internal data collection and GIS assessments 2) through procurement (if needed) Travel: 30	227,100.00	-		227,100.00			227,100.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	people*\$39*10 days: USD 23,400  Training - ex country: USD 148,000								
Travel	Output 1.3 Travel: USD 143,500  Training of Environment officers on gender responsive adaptation planning and implementation - ex country travel: USD 41,600	185,100.00	-		185,100.00			185,100.00	MoIT
Travel	Output 1.4 Travel: USD 44,496  Staff travel from Year 1- 5: Training and workshop - Ex-country: USD 201,700 In-country Training/workshop: USD 17,675	263,871.00	-		263,871.00			263,871.00	MoIT
Travel	Output 1.5 Training/workshop: USD 15,000 Study tour travel: USD 22,000 Travel for Assessment of potential PES sites: USD 50,000	87,000.00	-		87,000.00			87,000.00	MoIT
Travel	Output 2.1 Travel: USD 2,375	-	2,375.00		2,375.00			2,375.00	MoIT
Travel	Output 2.2 Workshop: USD 2,450 Travel for three watershed assessment: USD 4,500	-	6,950.00		6,950.00			6,950.00	MoIT
Travel	Output 2.4 Travel: USD 6,000	-	6,000.00		6,000.00			6,000.00	MoIT
Travel	Output 3.1 Travel cost: 5 workshops : USD 41,700 Travel cost for visit by staff and student of CST to project site and other ideal sites: USD 20,000 Travelling and Associated Fees: USD 100,000	-	-	161,700.00	161,700.00			161,700.00	MoIT
Travel	Output NIM PMC, Activity PMC: Project transport	-	-		-		72,000.00	72,000.00	MoIT

Expenditure Category	Detailed Description	Component (USDeq.)			Sub-Total	M&E	PMC	Total (USDeq.)	Responsible Entity (Executing Entity receiving funds from the GEF Agency)[1]
		Component 1	Component 2	Component 3					
	hire: USD 36,000 Project Staff travel: USD 36,000								
Office Supplies	Output NIM PMC, Activity PMC: Item: Stationery: USD 9,000	-	-		-		9,000.00	9,000.00	MoIT
Other Operating Costs	Output 1.2 Procurement of services for Printing of manual: USD 15,000	15,000.00	-		15,000.00			15,000.00	MoIT
Other Operating Costs	Output 3.1 Goods and materials: USD 60,000 Publishing of the article, books and research works in reputed journal publishers	-	-	60,000.00	60,000.00			60,000.00	MoIT
Other Operating Costs	Output NIM PMC, Activity PMC: Advertisements, notifications, announcements: USD 27,000	-	-		-		27,000.00	27,000.00	MoIT
Other Operating Costs	Output UNDP PMC, Activity PMC: Project Governance and monitoring Conduct Annual NIM audit: USD 18,000	-	-		-		18,000.00	18,000.00	UNDP
<b>Grand Total</b>		4,490,000.00	11,599,166.00	763,000.00	16,852,166.00	337,000.00	859,458.00	18,048,624.00	

Please explain any aspects of the budget as needed here

## ANNEX I: RESPONSES TO PROJECT REVIEWS

From GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF.

### Response to comments from STAP

STAP Comment 6 June 2023	Response
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<p>1. STAP recommends that at the PPG stage the project build on the data gathered and presented in the PIF to develop a clearer, more integrated articulation of the system. Much of what is needed is in the PIF, but it is not integrated. Instead, aspects of the system are currently captured under headings Situation Analysis (capturing the economic importance of the project area and the institutional capacity challenges facing Bhutan and the municipal governments) and Underlying Causes of Vulnerability (which addresses urbanization trends and some issues of inequality). This step feeds into the second recommendation.</p>	<p>During the PPG the text outlining the system has been improved with a more integrated narrative compared to that of the PIF. The system is described in the Project Rationale, encompassing the geographical, economic, and development aspects of the project's urban region. This includes an in-depth analysis of the area's physical landscape, economic activities, and governance and planning structures, offering a comprehensive understanding of the region's characteristics. Furthermore, the current and future climate situation is examined, identifying existing and predicted implications that may negatively affect the urban system. In addition, attention is paid to how these changes may affect vulnerable groups within the community.</p>
<p>2. During the PPG stage, project designers should use the integrated presentation of the system, and the climate data already presented in the PIF, to develop two or more simple narratives of the future that express uncertainties the project will have to navigate. For example, one narrative could take the RCP4.5 climate projections and slower rates of urbanization to develop one future, while another could take RCP8.5 and very rapid urbanization to develop another future. These would represent two simple, plausible futures that could be used to evaluate the likely efficacy of planned interventions and their outcomes. These narratives should also ground projected changes in the climate in terms of their outcomes for those living in the project area – for example, as noted above, what is the impact on the experience of flooding of a 15% increase in precipitation, and is that different than the experience of a 22% increase?</p>	<p>High-resolution downscaled climate data was utilized to assess the impacts of climate change, under various scenarios during the PPG stage. The project was developed with consideration of the outcomes derived from simple narratives, as detailed in the Annex 'Landscape and Climate Change Profile.' (UNDP Project Document Annex 19) This approach ensures that the project accounts for a range of possible climatic conditions and their potential effects, and is better equipped to anticipate and adapt to future climate challenges. As such the simple narratives in Annex 19, as well as the annex's climate predictions and underlying climate data, have informed the future climate descriptions in the CEO Endorsement Request document, including for RCP 4.5 and RCP 8.5 projections. However, due to data limitations, it was not possible to undertake detailed analysis during the PPG. That said as mentioned in Annex 19, the project used lower-resolution projection data from the National Institute for Environmental Studies (NIES) to study 1km*1km temperature and precipitation projection of Bhutan. Through this it was found, for instance, that rising temperatures impacts water resources by accelerating the rate and timing of snowmelt, that affects peak river discharge etc.</p>
<p>3. It is likely that executing recommendations 1 and 2 will result in the need to make some revisions to the theory of change, though these are likely to be minor</p>	<p>Noting that minor adjustments to the Theory of Change has been made during the PPG stage. However, these adjustments have not significantly altered the overall project framework or objectives.</p>
<p>4. In terms of stakeholder engagement, the project should confirm that there are no autonomous or local adaptations to either drought or flooding (this is implicit in the current PIF). If there are any such adaptations, the project should consider if its interventions will augment, improve upon, or compromise those adaptations. This will help to guard against maladaptation. See Section 3 of STAP's Advisory Document "A Decision Tree for Adaptation Rationale."</p>	<p>During the development of the project, in the PPG phase through extensive stakeholder consultations, including several in-depth discussions on the project design and action parameters with the National Task Force Group, it was determined that, there are no autonomous and local adaptation actions that the project could build upon. Consequently, the project does not incorporate any pre-existing local adaptation measures. However, the design of the project incorporates ongoing stakeholder consultations during implementation to ensure that any emerging or recognized autonomous and local adaptations measures will align and coordinate with the project's interventions as a crucial aspect of ensuring the sustainability and ownership of project's results as well as a measure to avoid overlaps and repetition.</p>
<p>5. While the PIF references transformation/transformational change several times, there is no clear explanation of how the proposed project will be transformative or how transformation will be achieved. The PIF references "fostering conditions for enabling transformational adaptation through the emphasis on the three key levers: (1) policy coherence and mainstreaming of gender-responsive climate adaptation, (2) strengthened governance for adaptation, and (3) knowledge exchange and collaboration." While no doubt these conditions might enable transformation, this does not necessarily mean that transformation will occur. In the PPG stage, project designers should consult the STAP</p>	<p>During the PPG stage the Theory of Change was reviewed and further refined (as mentioned above) and the project has been designed based on the Government of Bhutan's interests aimed at aligning the project interventions so that they are compatible with the Government strategies and will enable transformation as well as act as a catalyzer. The project will achieve permanent transformation through the following levers: institutional coordination and policy harmonization for integrating gender-responsive climate adaptation (Outcome 1.1), strengthening urban planning and</p>

<p>Advisory Document “Achieving Transformation Through GEF Investments,” to provide a more robust theory of change that results in transformation. The advisory document has useful suggestions for thinking through and designing project interventions that will not just enable transformation, but ideally catalyze it.</p>	<p>management for climate adaptation (Outcomes 1.2 and 1.3), incorporating climate adaptation into education and training programs (Outcome 1.4), improving financial mechanisms (Outcome 1.5), and promoting knowledge exchange and awareness raising (Outcome 3.1) on climate adaptation. The aforementioned elements are interconnected through clearly defined activities. Furthermore, the project will implement tangible Nature-based Solutions (NbS) interventions designed to tackle climate change in the cities of Thimphu and Paro. Given its scope and complementary activities, the project is set to catalyze transformational change.</p>
<p>6. In developing the policy coherence framework, STAP recommends significantly broadening the stakeholders currently identified in the PIF to ensure that project designers uncover and address possible perverse incentives and maximize GEF and other investments at the PPG stage. STAP’s documents. Enhancing policy coherence through GEF operations and Framing policy coherence for the GEF are useful resources for this effort.</p>	<p>The project during the PPG stage broadened its stakeholder group to ensure that the project design would maximize GEF investments and optimize the synergies with national efforts. A key component in this regard was the ongoing involvement of the National Task Force Gorup that consisted of members of most if not all relevant ministerial departments. In addition, the project implementation will further pursue the listed concern primarily through Output 1.1 which focuses on policy coherence, will actively engage all relevant stakeholders, playing a role in urban planning and management processes. This activity will be led by the Policy and Planning Division of the Ministry of Infrastructure and Transport and involve the Ministry of Energy Natural Resources and Environment, Ministry of Home Affairs, National Center for Hydrology and Meteorology, National Land Commission Secretariat, as well as district and local governments.</p>

## Council comments

June 2023 Council Comment	Response
<p>Comment for all UNDP projects</p> <p>Following previous Council decisions related to UNDP GEF Management, all projects included in the Work Program implemented by UNDP shall be circulated by email for Council review at least four weeks prior to CEO endorsement/approval. Project reviews will take into consideration the relevant findings of the external audit and management responses and note them in the endorsement review sheet that will be made available to the Council during the 4- week review period.</p>	<p>Secretariat to advise on this requirement and its current applicability.</p>
<p><b>Germany Comments:</b></p> <p><u>Germany approves the following PIF in the work program but requests that the following comments are taken into account:</u></p> <p>Germany welcomes the proposal which aims to build urban resilience of communities to the impacts of climate change in the Thimphu-Paro region of Bhutan. Germany appreciates the comprehensiveness of the proposed interventions, and their cross-cutting gender focus, to enhance adaptive capacity of 46% of the total urban population through investments in institutional capacities (national and sub-national), nature-based solutions, flood management, private investments mobilisation, as well as enhanced participation of youth through vocational training and skilling. The project also aims to strengthen climate and geospatial information systems for risk-informed urban planning. This is crucial as the two cities in Bhutan, Thimphu and Paro are major urban centers acutely exposed to climate change, which is compounded by rapid urbanisation and tourist influx.</p>	



Germany requests that the following requirements are taken into account during the design of the final project proposal:	
Germany acknowledges the climate risks for the two major cities of Thimpu and Paro and the need for the project activities. Yet, a comprehensive climate risk and vulnerability assessment (CRVA) seems missing as part of Component 1 for the two cities to identify and assess present and future risks, and clearly identify the most relevant adaptation measures (structural, institutional, financial, and governance) that will support the execution of Component 2, for comprehensive urban resilience building.	<p>CRVA for the two cities has been partially completed and is featured in Annex 19 'Landscape and Climate Change Profile', with a summary included in the Climate Rationale section of the CEO Endorsement Request. Furthermore, throughout the project implementation, Output 1.3 of Component 1 will involve a more comprehensive CRVA analysis conducted in collaboration with stakeholders, serving as a prerequisite for the development of local climate adaptation plans, which will also serve to originate further local adaptation measures.</p> <p>Component 2 activities have been defined using existing strategies and plans that already integrate considerations for climate challenges.</p>
Germany appreciates the project's gender-inclusive strategy across all project components, together with the inclusion of other vulnerable groups and youths. Yet, there seems to be a gap for a systematic plan to comprehensively involve all stakeholders and what approaches will be undertaken to build their resilience. A detailed participatory stakeholder consultation plan needs to be developed as part of Component 1 to understand the specific needs of the vulnerable groups.	The project will develop downscaled vulnerability maps that will be integrated into the future climate GIS system (Output 1.2). Vulnerable groups will actively participate in local adaptation planning processes, including the formulation of community-based nature-based solution (NbS) plans (Output 1.3). In addition, prior to the design of the physical sites in Component 2, consultations will be carried out with the local population and communities living near or using the sites. A Stakeholder Engagement Plan for the project has been formulated and is available as an annex. This Stakeholder Engagement plan together with the Gender Action Plan as well as the projects Social and Environment Safeguard documentation, will guide the project's engagement with stakeholders. The implementation of these documents will ensure that the project activities will prioritize the inclusiveness of vulnerable populations as well as provide for target approaches for specific stakeholder involvement. This includes initiatives such as encouraging their participation in training programs and assessing their access to funding for NbS entrepreneurship.
Germany additionally requests a coherent strategy for the project alignment with national priorities.	The project holds significant relevance for Bhutan due to the country's rising urbanization rate. Historically, the majority of donor-funded projects in Bhutan have concentrated on addressing climate change in rural areas. The details of the project alignment with existing national strategies and plans is provided as part of the Project Rationale - Baseline national and local policy framework of the CEO Endorsement Request.
Germany requests clarity around the complementarity of this project with multiple ongoing initiatives for urban resilience in Bhutan, including GEF's "Advancing Climate Resilience of the Water sector in Bhutan (ACREWAS)".	Complementarity of this project with other ongoing initiatives is provided under Ongoing initiatives and projects (as well as in Baseline Projects and Investments) of the CEO Endorsement Request. The ACREWAS project primarily targets climate change adaptation in rural areas, but certain activities tested in ACREWAS will also be implemented within the scope of this project.
Germany appreciates the high proposed co-financing but requests more clarity on the commitments from the co-financing agencies and the interventions that they would be supporting.	The details of the project Co-financing is outlined in the Co-financing letters and briefly described in the CEO Endorsement Request document. Furthermore, throughout the project implementation phase, records will be maintained regarding the expenditure of co-financing by all co-financiers. These expenditures will be reported annually through Project Implementation Reports (PIRs) where verified reporting from the co-financing partners will be included.

Germany recommends ensuring that awareness of water governance is raised throughout the river basin, otherwise successes might quickly disappear.

Water governance will be raised as part of the project in its target areas of Thimphu and Paro regions the most populous areas in Bhutan. The river basin encompasses Thimphu, Paro, and several local communities, with the upper watershed being predominantly mountainous and sparsely settled. The project activities are designed taking into consideration the situation with Thimphu and Paro situated near water sources and its impacts on resilience of the populations of the two cities. However, all activities designed to be within Thimphu and Paro as part of the project carefully assesses their potential impacts on downstream territories and communities and this consideration will be part of the project implementation as well.