



PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

- 1.1 Project title:** Building climate resilience of urban systems through Ecosystem-based Adaptation (EbA) in Latin America and the Caribbean.
- 1.2 Project number:** GFL/
PMS: 5681
- 1.3 Project type:** FSP
- 1.4 Trust Fund:** SCCF
- 1.5 Strategic objectives:**
GEF strategic long-term objective: CCA climate change adaptation
- 1.6 UNEP priority:** Climate Change Adaptation
- 1.7 Geographical scope:** Regional multi-country Latin America and the Caribbean
- 1.8 Mode of execution:** Internal/External
- 1.9 Project executing organization:** UNEP-ROLAC, MARN, MWLECC and SEMARNAT
- 1.10 Duration of project:** 48 months
Commencing:
Technical completion:
Validity of legal instrument: 56 months

1.11 Cost of project	US\$	%
Cost to the GEF Trust Fund	6,000,000.00	16.8
Co-financing		
Grant		
IDB (San Salvador)	21,986,000	61.5
JSIF (Kingston)	4,000,000	11.2
CMAS (Xalapa)	3,120,000	8.7
UNEP ROLAC	400,000	1.1
<i>Sub-total</i>	35,506,000	
In-kind		
UNEP ROLAC	228,000	0.6
<i>Sub-total</i>	228,000	
Total	35,734,000	100

1.12 Project summary

The Latin America and Caribbean (LAC) region is the second most urbanised region in the world¹, with ~80% of the population living in cities. Within the next two decades, this proportion is projected to reach ~85%, thereby ranking the cities of the LAC region among the fastest-growing in the developing world². The rate of urban expansion is faster in small- and medium-sized cities relative to mega cities³. In the medium-sized cities of San Salvador, Kingston and Xalapa – in El Salvador, Jamaica and Mexico respectively – rapid urbanisation is coupled with limited urban planning. This has resulted in several socio-economic problems, including: i) rapid and unplanned expansion of housing into areas that are vulnerable to natural disasters or otherwise unsuitable for settlement; ii) inadequate access to public services such as waste management, sanitation and refuse collection; and iii) unsustainable management and use of natural resources, particularly water.

This rapid urbanisation and the associated expansion of cities is degrading urban and peri-urban ecosystems – including wetlands, green spaces and forests – that provide a wide range of ecosystem services for urban communities. The effects of degradation of these ecosystems include: i) increased soil erosion as a result of reduced vegetation cover; ii) reduced infiltration of water in degraded watersheds and catchment areas, thereby resulting in reduced recharge of groundwater and an increased incidence of flooding; and iii) decreased water quality as a result of increased pollution and deposition of sediment in rivers and other water ways. The degradation of urban water bodies such as wetlands and rivers is further exacerbated by the inadequate management of urban waste, which results in the blockage of waterways and contributes to urban flooding as well as the incidence of vector- and water-borne diseases. The abovementioned effects of ecosystem degradation are a threat to the lives and well-being of urban communities in the LAC region and increase the risk of urban communities vulnerable to natural disasters. The goods and services generated by intact urban ecosystems have the potential to mitigate these threats by providing multiple benefits to urban communities. These benefits include *inter alia*: i) the provision of natural resources such as food and water; and ii) regulatory functions, including flood mitigation, water filtration and waste decomposition. In addition, urban ecosystems provide recreational and cultural benefits while improving the aesthetics of the city.

The negative effects of environmental degradation and the consequent threats to the well-being of urban communities in the LAC region are exacerbated by climate change and climate variability. Effects of climate change in the LAC region that have already been widely observed include *inter alia*: i) increased variability in the timing and mean annual volume of rainfall received; ii) increased mean annual temperature and number of 'hot' days per year; iii) increased frequency and severity of climate-related hazards such as droughts, floods and storms; and iv) increased frequency of extreme events such as hurricanes. Under future climatic conditions, urban communities in the LAC are consequently predicted to experience

¹ North America is the most urbanised region in the world with ~82% of the population living in cities.

² United Nations, Department of Economic and Social Affairs, Population Division. 2014. World Urbanization Prospects: The 2014 Revision, Highlights. Available online at: <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>. Accessed on 4 March 2015.

³ Between 1990 and 2014, the global population living in medium-sized cities increased by ~50% compared with ~34% for mega cities over the same period. By 2030, the current population of medium-sized cities is expected to increase by ~36% to 1.1 billion.

inter alia: i) reduced quality and availability of water for irrigation and domestic use; ii) decreased food security as a result of reduced agricultural productivity; iii) increased economic losses, infrastructural damage and loss of life as a result of climate-related disasters such as floods and landslides; and iv) greater risks to health from heat stress as well as an increased prevalence of vector- and water-borne diseases.

To address the vulnerability of urban communities to the effects of climate change, governments in the LAC region need to develop and implement cost-effective, low-risk solutions for integrating adaptation to climate change into social and economic development plans for individual cities. The approach of Ecosystem-based Adaptation (EbA) is a cost-effective way to reduce the vulnerability of urban and peri-urban communities to climate change by protecting, maintaining and rehabilitating priority ecosystems in urban areas to act as physical buffers against climate change related hazards while generating multiple social and environmental co-benefits.

The governments of El Salvador, Jamaica and Mexico therefore request SCCF funding for a Full-Sized Project (hereafter referred to as “the SCCF-financed project” or “the project”) that will be executed in one selected medium-sized city per country. These countries were selected following an agreement with the GEF to test urban EbA interventions in countries with diverse ecosystems and urban climate change challenges that are representative for the LAC region. For example, San Salvador is located in a mountainous area, while Kingston is located along the coast. In addition, the three selected countries indicated a particular interest and willingness to become involved in the project. Increased adaptive capacity of urban communities will be achieved through the project by: i) mainstreaming urban Ecosystem-based Adaptation (EbA) into medium- and long-term urban development planning; ii) implementing urban EbA interventions to foster climate-resilient communities; and iii) acquiring knowledge and raising awareness of urban EbA throughout the LAC region.

The project will build on several ongoing baseline projects both national and regional, and will be executed by ROLAC, the Ministry of Environment and Natural Resources (MARN) in El Salvador, the Ministry of Water, Land, Environment and Climate Change (MWLECC) in Jamaica, the Ministry of Environment and Natural Resources (SEMARNAT) in Mexico, and implemented by the United Nations Environment Programme (UNEP).

TABLE OF CONTENTS

SECTION 1: PROJECT IDENTIFICATION	1
ACRONYMS AND ABBREVIATIONS	6
SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION).....	9
2.1. Background and context	9
2.2. Global significance	22
2.3. Threats, root causes and barrier analysis	22
2.4. Institutional, sectoral and policy context.....	34
2.5. Stakeholder mapping and analysis	46
2.6. Baseline analysis and gaps.....	49
2.7. Linkages with other GEF and non-GEF interventions.....	64
SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)	74
3.1. Project rationale, policy conformity and expected global environmental benefits.....	74
3.2. Project goal and objective	82
3.3. Project components and expected results	82
3.4. Intervention logic and key assumptions	96
3.5. Risk analysis and risk management measures	97
3.6. Consistency with national priorities or plans	101
3.7. Additional cost reasoning	106
3.8. Sustainability	109
3.9. Replication	111
3.10. Public awareness, communications and mainstreaming strategy.....	112
3.11. Environmental and social safeguards	113
SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS.....	113
SECTION 5: STAKEHOLDER PARTICIPATION.....	118
SECTION 6: MONITORING AND EVALUATION PLAN	123
SECTION 7: PROJECT FINANCING AND BUDGET.....	125
7.1. Overall project budget	125
7.2. Project co-financing.....	125
7.3. Project cost-effectiveness	126
Appendices	129
Appendix 1–3 Background countries	129
Appendix 4: Budget by project components and UNEP budget lines	130
Appendix 6: Results Framework	155
Appendix 7: Work plan and timetable	162
Appendix 8: Key deliverables and benchmarks	164
Appendix 9: Costed M&E plan	164
Appendix 10: Summary of reporting requirements and responsibilities	166
Appendix 11: Standard Terminal Evaluation TOR	168
Appendix 12: Decision-making flowchart and organizational chart.....	169
Appendix 13: Terms of Reference.....	169
Appendix 14: Co-financing commitment letters from project partners.....	177
Appendix 15: Tracking Tools.....	178
Appendix 16: Draft procurement plan	179
Appendix 17: Site selection criteria and process.....	182
Appendix 18: Environmental and Social Safeguards checklist	183
Appendix 19: UNEP comparative advantage.....	188

Appendix 20:	Theory of Change (Linkages between SCCF project Components, Outcomes and Outputs including related activities	189
Appendix 21:	Inception and validation workshops	190
Appendix 22:	Execution arrangements with countries – letters of request.....	190
Appendix 23:	Letters of Endorsement from Countries	190
Appendix 24:	Accountability Framework	191

ACRONYMS AND ABBREVIATIONS

AFO	Administration and Financial Officer
AMSS	Metropolitan Area of San Salvador
ANDA	National Administration of Water and Sewage
AWP	Annual Work Plans
BMUB	Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
C3	The Climate Change Council
CA	Central America
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CCADRR	Climate Change Adaptation and Disaster Risk Reduction
CCAC	National Climate Change Advisory Committee
CCAU	Climate Change Adaptation Unit
CCCCC	Caribbean Community Climate Change Centre
CCCI	Cities and Climate Change Initiative
CCD	Climate Change Division
CeCadeSu	Education and Training Centre for Sustainable Development
CGRU	Urban Risk Management Committee
CIMH	The Caribbean Institute for Meteorology and Hydrology
CMAS	Municipal Counsel for Water and Sanitation
CMIA	Integrated Centre to Monitor Threats
CMO	The Caribbean Meteorological Organization
CMI	Caribbean Meteorological Institute
COHI	Caribbean Operational Hydrological Institute
CONAGUA	National Water Commission
CONAFOR	National Forestry Commission
CONANP	National Commission of Natural Protected Areas
CSGM	Climate Studies Group, Mona
CTCN	Climate Technology Centre and Network
DACGER	Department of Climate Change Adaption and Strategic Management of Risk
EbA	Ecosystem-based Adaptation
ENCC	National Climate Change Strategy
ENMA	National Environmental Strategy
ENSO	El Niño Southern Oscillation
EO	Evaluation Office
ESCI	Emergent and Sustainable Cities Initiative
FCAS	Fund of Cooperation for Water and Sanitation
FD	Forestry Department
FGB	Fernando Gutiérrez Barrios
FMCN	Mexican Fund for the Conservation of Nature
FNC	Fifth National Communication
GAN	Global Adaptation Network
GCF	Green Climate Fund
GEF	Global Environmental Facility
GEI	Gender Equity Index
GHG	Green House Gas
GOES	Government of El Salvador

GOJ	Government of Jamaica
GOM	Government of Mexico
GSP	Global Support Programme
GT-Adapt	Inter-ministerial Working Group on Adaptation
IA	Implementing Agency
ICDP	Integrated Community Development Project
ICZM	Integrated Coastal Zone Management
IDB	Inter-American Development Bank
IMCC	Inter-ministerial Commission on Climate Change
IMWCR	Integrated Management of Water and Coastal Resources
INDC	Intended National Determined Contribution
INECC	National Institute for Ecology and Climate Change
JaNEAP	Jamaica National Environmental Action Plan
JPI	Johannesburg Plan of Implementation
KAPs	Knowledge, Attitudes and Practices
KCT	Kingston Container Terminal
KMA	Kingston Metropolitan Area
LA	Latin America
LAC	Latin America and the Caribbean
LDCF	Least Developed Country Fund
LDUC	Land Development and Utilisation Commission
LGAH	The General Law for Human Settlements
LGCC	The General Law on Climate Change
LTRP	Long-term Research Programme
MAF	Ministry of Finance
MAG	Ministry of Agriculture and Livestock
MARN	Ministry of Environment and Natural Resources
MDGs	Millennium Development Goals
MGDT	Ministry of Government and Land Development
MI	Ministry of the Interior
MINEC	Ministry of Economy
MINED	Ministry of Education
MITUR	Ministry of Foreign Affairs
MOAF	Ministry of Agriculture and Fisheries
MOFP	Ministry of Finance and Planning
MOP	Ministry of Planning
MOPTVDU	Ministry of Public Works, Transport, Housing and Urban Development
MoU	Memorandum of Understanding
MREX	Ministry of Foreign Affairs
MSI	Mauritius Strategy of Implementation
MSTEM	Ministry of Science Technology, Energy and Mining
MTE	Mid-Term Evaluation
MTR	Mid-Term Review
MWLECC	Ministry of Water, Land, Environment and Climate Change
NA	North America
NAP	National Adaptation Plan
NBSAP	National Biodiversity Strategic Action Programme
NCSA	National Capacity Self-Assessment
NCU	Northern Caribbean University
NEPA	National Environment and planning Agency

NGO	Non-Governmental Organisation
NPGE	National Policy for Gender Equality
NRCA	Natural Resources and Conservation Authority
OPAMSS	Planning Office of the Metropolitan Area of San Salvador
PECC	Special Programme on Climate Change
PES	Payment for Environmental Services
PIOJ	Planning Institute of Jamaica
PIR	Project Implementation Review
NCU	Project Management Units
PNCC	First National Plan on Climate Change
PNMA	National Environmental Policy
PPCR	Pilot Programme for Climate Resilience
PSC	Project Steering Committee
PVCC	Veracruz Programme on Climate Change
RADA	Rural Agriculture Development Authority
RC	Regional Coordinator
SA	South America
SBS	State-Level Biodiversity Strategies
SCA	Atmospheric Science Centre
SCCF	Special Climate Change Fund
SDGs	Sustainable Development Goals
SEDEMA	State Secretary for the Environment
SEMARNAT	Ministry of Environment and Natural Resources
SEP	Ministry of Public Education
SINACC	The National System for Climate Change
SINAMA	The National Environmental Management System
SLR	Sea Level Rise
SNC	Second National Communications
TAP	Technology Action Plan
TCPA	Town and Country Planning Authority
TM	Task Manager
TNA	Technology Needs Assessments
TNC	Third National Communication
ToT	Training of Trainers
UES	University of El Salvador
UNAM	Universidad Nacional Autónoma de México
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNES	The NGO Salvadoran Unit
UNFAO	United Nations Food and Agricultural Organisation
UNFCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations Office for Disaster Risk Reduction
UTEC	University of Technology
UWI	University of the West Indies
WRA	Water Resources Authority
WRI	World Resources Institute
XMA	Xalapa Metropolitan Area

SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)

2.1. Background and context

1. The Latin America and Caribbean (LAC) region is the second most urbanised region⁴ in the world with ~80% of the population living in cities⁵. Within the next two decades, this proportion is projected to reach ~85% thereby placing cities within the LAC region among the fastest growing in the developing world⁶. This rate of urban expansion is faster in small and medium-sized⁷ cities relative to mega cities⁸ and by 2030, the current population of medium-sized cities is expected to increase by ~36% to 1.1 billion people⁹. Rapid urbanisation in medium-sized cities is also occurring in the context of limited urban planning. This results in socio-economic problems such as housing into areas that are vulnerable to natural disasters or otherwise unsuitable for settlement and unsustainable use of natural resources, particularly water. This rapid urbanisation and unplanned expansion of cities is reducing urban and peri-urban ecosystems – including wetlands, green spaces and forests – that provide a wide range of ecosystem services that contribute considerably to the well-being of urban communities. These problems will be exacerbated by the predicted effects of climate change, which include the increased frequency and intensity of floods and droughts as a result of increased temperature and rainfall variability.

2. The governments of El Salvador, Jamaica and Mexico request SCCF funding for a Full-Sized Project – hereafter referred to as “the SCCF-financed project” or “the project” – that will be implemented in San Salvador, Kingston and Xalapa respectively to reduce the vulnerability of urban communities to the current and future effects of climate change. This will be achieved through the project by: i) mainstreaming urban Ecosystem-based Adaptation (EbA) into medium- and long-term urban development planning; ii) implementing urban EbA interventions to reduce the vulnerability of local communities; and iii) acquiring knowledge and raising awareness of urban EbA throughout the region.

3. The SCCF-financed project is a flagship project for UNEP on urban EbA. Therefore, lessons learned through piloting this project in San Salvador, El Salvador; Kingston, Jamaica; and Xalapa, Mexico will inform the implementation of urban EbA in other cities within the LAC region and elsewhere in the world.

4. The project is consistent with the “Revised Programming Strategy on Adaptation to Climate Change for the LDCF¹⁰ and SCCF”. The project will be executed through the UNEP Regional office for Latin America and the Caribbean (ROLAC) in partnership with the following national ministries: i) the Ministry of Environment and Natural Resources (MARN), El Salvador; ii) the Ministry of Water, Land, Environment and Climate Change (MWLECC), Jamaica; and iii) the Ministry of Environment and Natural Resources (SEMARNAT), Mexico.

⁴ North America is the most urbanised region in the world with ~82% of the population living in cities.

⁵ United Nations, Department of Economic and Social Affairs, Population Division. 2014. World Urbanization Prospects: The 2014 Revision, Highlights. Available online at: <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>. Accessed on 4 March 2015.

⁶ ECLAC. 2012. Social Panorama of Latin America. Panamá: Economic Commission for Latin America and the Caribbean (ECLAC) United Nations.

⁷ Population between 1 to 5 million people.

⁸ Between 1990 and 2014, the global population living in medium-sized cities increased by ~50% compared with ~34% for mega cities over the same period.

⁹ United Nations, Department of Economic and Social Affairs, Population Division. 2014. World Urbanization Prospects: The 2014 Revision, Highlights. Available online at: <http://esa.un.org/unpd/wup/Highlights/WUP2014-Highlights.pdf>. Accessed on 17 March 2015.

¹⁰ Least Developed Country Fund (LDCF).

UNEP – through ROLAC will be the implementing agency (IA) and provide the required technical support to the relevant ministries and local authorities.

Geographic context



Figure 1. The four subregions in Latin America.

5. Latin America refers to the region south of the United States of America where predominantly Roman languages are spoken. The region includes North America (NA), Central America (CA), South America (SA) and the Caribbean (See Figure 1). For the purpose of this project, “Latin America” (LA) is the region including the combined Americas. The “Caribbean” is considered as a separate subregion.

Latin America

6. The LA region consists of 20 states and covers ~15% of the earth’s land surface area¹¹. The Andes mountain range – running from Central to South America – creates the following climate zones according to the Köppen classification¹² tabled below:

Table 1. Climate zones in NA, CA and SA according to the Köppen classification.

Köppen classification	Temperature	Precipitation	Countries
Tropical (A ¹³)	Temperatures do not drop below 18°C.	<u>Wet:</u> Annual precipitation often greater than 1500 mm. <u>Wet and dry:</u> Annual rainfall between 750 and 1500 mm. <u>Monsoon:</u> One or more months with 60 mm or less	Belize, Costa Rica, Colombia, Mexico, Surinam and Brazil.

¹¹ http://en.wikipedia.org/wiki/Latin_America. Accessed on 25 February 2015.

¹² UNEP-ROLAC. 2014. Andean agriculture in the face of climate change. Available online at: http://www.pnuma.org/meba/documentos/AAFCC_EN_baja.pdf. Accessed 15 June 2015.

¹³ <http://www.eoearth.org/view/article/162264/>. Accessed on 15 June 2015.

		rainfall.	
Dry (B)	Depends on altitude. <u>Dry and cool</u> (at mid-latitude): mean average temperature below 18° C.	Evaporation exceeds precipitation.	Mexico, Peru and Chile
Temperate (C)	An average monthly temperature above 22 °C in the warmest months, and an average monthly temperature above -3° C in their coldest months.	In the driest winter month, the average precipitation is less than one-tenth of the average precipitation experienced during the wettest summer month; or the average precipitation in the driest summer month is less than 40 mm and less than one-third of the average precipitation in the wettest winter month.	Brazil, Uruguay, Chile, Argentina and Mexico.

7. LA is located on the fault line between the Nazca and South American tectonic plates and Cocos and Caribbean tectonic plates. Consequently, the area from Mexico to Chile experiences volcanic and earthquake activity. In NA and CA, the Atlantic and Pacific oceans further influence the geography of the area. In the relatively narrow strip of land that separates these two oceans, the topography varies from volcanic mountains, highlands, lowlands and to a lesser extent savannas and swamps¹⁴.

Caribbean

8. The Caribbean consists of the Caribbean Sea and its islands. The area is southeast of the Gulf of Mexico and the North American mainland, east of CA and north of SA. The Caribbean islands comprise 30 territories that include sovereign states (e.g. Jamaica), overseas departments (e.g. Guadeloupe and Martinique) and dependencies (e.g. Aruba and Bermuda)¹⁵. As a result of tectonic activity, the islands are located within thousands of square kilometres of sea¹⁶. There are three main types of topography in the Caribbean: i) mountains, over 1200m, such as the Blue Mountains in Jamaica; ii) hills ranging from 600 to 1200 m, such as the high plateau in Jamaica; and iii) coastal plains.

Socio-economic context

Latin America

9. In LA, the socio-economic context of its countries varies greatly and is among the least equitable in the world¹⁷. Within the LAC region, Argentina, Chile, Mexico, Panama and Uruguay have the greatest per capita GDP, with a minimum of US\$16,000. In contrast, Nicaragua, Honduras, Bolivia and Guatemala have the lowest per capita GDP, with a maximum of US\$5,500. At the local level, such income inequalities contribute to negative economic, social and security developments¹⁸. In particular, the urban Gini-coefficient¹⁹ of El

¹⁴ http://aventalearning.com/courses/GEOGx-HS-A09/a/unit03/GEOHS_3.B.10.html. Accessed on 2 March 2015.

¹⁵ <http://en.wikipedia.org/wiki/Caribbean>. Accessed on 27 February 2015.

¹⁶ <http://countrystudies.us/caribbean-islands/4.htm>. Accessed on 6 March 2015.

¹⁷ ECLAC. 2011. Social panorama of Latin America 2011.

¹⁸ These developments include unemployment, poverty and crime.

¹⁹ The Gini-coefficient measures the level of inequality as a ratio between 0 and 1, with 0 indicating perfect equality.

Salvador and Mexico lies between 0.45 and 0.49, which is considered to be high²⁰. This means that the poorest 20% of the population earn 3% of the total income in a country, whereas the wealthiest 20% of the population earn 50% of the total income. This inequality is linked to the unequal access to water, sanitation and adequate housing for the most vulnerable groups – particularly indigenous people, children and women living in poverty – and their sensitivity to the effects of extreme events such as hurricanes and flooding. As a result of this unequal access, these vulnerable groups are the least protected against such extreme events²¹. In addition, this income inequality leads to an increasing net migration, mainly to the United States.

10. In 2015, the estimated population of LA was ~615 million people²², with the majority living in cities. In the 1930s, urbanisation in this region expanded with large-scale immigration from Europe. Since 1950, the growth rate in larger cities has decreased. However, a large proportion of the urban population in a country – and in some cases of the total population – remains concentrated in a single urban centre. This is particularly noticeable in Uruguay, Argentina, Chile, Paraguay, and Peru. Figure 2 shows the anticipated percentages of people in the LAC region living in urban areas.

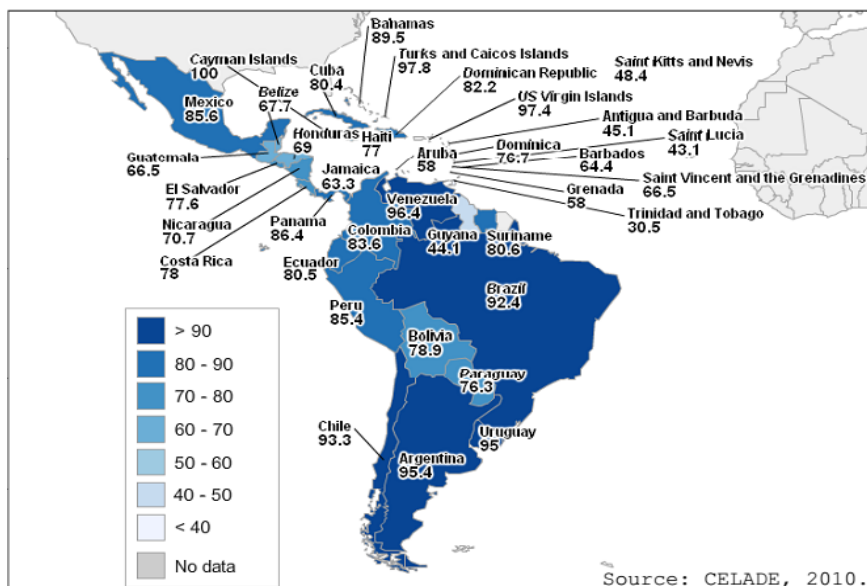


Figure 2. Anticipated percentage of the national population in urban areas within LA and the Caribbean in 2040²³.

Caribbean

11. The economy in the Caribbean region is mainly based on two sectors: i) natural resources, such as bauxite, gypsum and gas; and ii) tourism. Both of these sectors contribute considerably to the economy and the creation of jobs. Although the contributing sectors are similar, the countries within the Caribbean region differ considerably in terms of

²⁰ UN-Habitat 2010. State of the World's cities 2010/2011: bridging the urban divide.

²¹ http://en.wikipedia.org/wiki/Latin_America#Economy_2. Accessed on 27 February 2015.

²² http://en.wikipedia.org/wiki/List_of_Latin_American_countries_by_population. Accessed on 27 February 2015.

²³ Samaniego, J. 2012. Demography, Urbanization and Natural Resources in Latin America and the Caribbean: Trends and Forecasts. Division of Sustainable Development and Human Settlements Economic Commission for Latin America and the Caribbean (ECLAC).

socio-economic development. The inequality of this development is reflected through the Gini coefficient, which ranges from 0.4 for Trinidad and Tobago to 0.59 for Haiti. Jamaica has a Gini coefficient of 0.45²⁴.

12. The population of the Caribbean is estimated at ~40 million people²⁵. Currently, an insufficient number of houses exists to meet the demand of the growing population. This has led to increased housing prices with the result that many people cannot afford to live in formal housing. For example, in Jamaica ~20% of the residents live in informal settlements, which is expected to increase as a result of the growing population. In addition, in 2014 ~50% of Jamaica's population lived in cities, which is expected to reach ~66% by 2050²⁶. Similarly, ~45% of the population in CASHFI²⁷ countries live in urban areas, which is expected to grow to ~55% by 2050.

General Climatic conditions

Latin America

13. Most of LA is located within the tropics. However – unlike other regions in the tropics – the presence of the Andes mountain range has resulted in a wide variation in temperature across the area. Moreover, in LA the variation in altitude has a greater effect on temperature compared with latitudinal position. Temperatures in this region vary from 30°C along the coast to below 0°C at altitudes higher than 4000 m. Similarly, the amount of rainfall is strongly influenced by the presence of the Andes. As a result of the north-to south position of this mountain range, the western region of LA – such as the Atacama Desert in Chile – is relatively dry. In contrast, the eastern region of the Andes is relatively wet. The northeast tropical rain forest – including the Amazon River basin – is located in this wet region. In addition, LA's climate is affected by two recurrent weather phenomena, namely El Niño and La Niña. El Niño occurs when a decrease in wind speed and ocean circulation coincides with an increase in eastern Pacific surface temperatures. During a La Niña cycle, the opposite occurs which results in colder and wetter conditions²⁸.

Caribbean

14. The climate in the Caribbean is tropical with year-round temperatures averaging ~25–30°C. However, elevation also strongly influences the region's climatic conditions. For example in Jamaica, the coastal city of Kingston experiences an average temperature of 26° C, whereas at 600 m in the Blue Mountains, the average temperature is 13° C²⁹.

15. The Caribbean experiences a rainy season from May to November and a dry season from November to April. This rainy season coincides with the hurricane season resulting in heavy rains that contribute to the amount of rainfall during this period. Within the Caribbean, rainfall varies greatly between islands and at a finer scale within islands. Overall, the Caribbean's climate is strongly influenced by: i) elevation; ii) trade winds; and iii) upwellings of currents. For example, in Jamaica, Kingston receives ~85 mm of rainfall per year, whereas

²⁴ <http://www.indexmundi.com/facts/indicators/si.pov.gini/map/central-america>.

²⁵ <http://www.internetworldstats.com/stats11.htm>. Accessed on 6 March 2015.

²⁶ <http://blogs.iadb.org/caribbean-dev-trends/2014/10/29/housing-policy-urbanization-caribbean-state-debate/>. Accessed 6 March 2015.

²⁷ CASHFI countries include Antigua & Barbuda, Bahamas, Barbados, Cayman Islands, Dominican Republic, Haiti, Jamaica, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago.

²⁸ <http://www.pmel.noaa.gov/tao/el-nino/el-nino-story.html>. Accessed on 5 March 2015.

²⁹ http://www.metservice.gov.jm/documents/Mean_Climatological_Data.pdf. Accessed on 2 August 2015.

the Blue Mountains receive an average of ~500 mm. In addition, cool upwellings have resulted in the islands of Aruba, Bonaire and Curacao – in the south of the Caribbean – being relatively dry. In contrast, warm moist trade winds from the east create wetter conditions on the eastern side of the Caribbean islands³⁰.

Current and observed climate change and variability

Latin America

16. In the period of 1905–2005, the LAC region experienced an **average temperature** increase of 0.74°C. During 1970–2005, this temperature increase was greatest in CA and northern Mexico with an average of 0.4°C per decade to a total of ~1.2°C. However, during 1955–2005, the average temperature increased by 0.13°C per decade to a total of ~1°C. As a result of the increase in temperatures in SA, glaciers in the Andes have receded. In contrast, temperatures along the west coast of SA have declined by an average of ~1°C because of increased upwelling of coastal waters and more intense trade winds³¹. Table 2 provides a summary of the observed changes in temperature experienced in CA and SA.

Table 2. Summary of the regional observed changes in temperature, precipitation and climate extremes in various sectors of Central America (CA) and South America (SA). NAMS = North American Monsoon System. ³².

Region	Observed changes	Period	References
CA and northern SA	Precipitation in NAMS: +0.94 mm per day over 58 years.	1943–2002	Englehart & Douglas, 2006.
	Rainfall onset in NAMS: -10 to -20 days over 57 years.	1948–2004	Grantz et al. 2007.

17. **Rainfall** patterns have become more variable across the region. For example in CA, the onset of the rainy season now occurs later in the year with rainfall becoming more intense at the start of the rainy season. In CA and Mexico, the amount of intense rainfall has increased by an average of 100 mm, but now falls over a shorter period³³. The intense rainfall that occurs over a shorter period has become more frequent across the region and may coincide with a decrease in average annual rainfall. In combination with an increase in temperatures, this will have notable consequences for the population in SA, particularly for those living in urban areas. For example, intense rainfall in cities increases the risk of flooding, which affects the housing and livelihoods of urban communities. Figure 3 shows a summary of the observed rainfall patterns in LA during the period 1990–2002.

³⁰ <http://countrystudies.us/caribbean-islands/4.htm>. Accessed on 2 March 2015.

³¹ Economic Commission for Latin America and the Caribbean (ECLAC). 2010. Economics of Climate Change in Latin America and the Caribbean. UN, Santiago, Chile.

³² Magrin, G.O., J.A. Marengo, J.-P. Boulanger, et al. 2014. Central and South America. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 1499-1566.

³³ The rainy season is reduced by a few days per year.

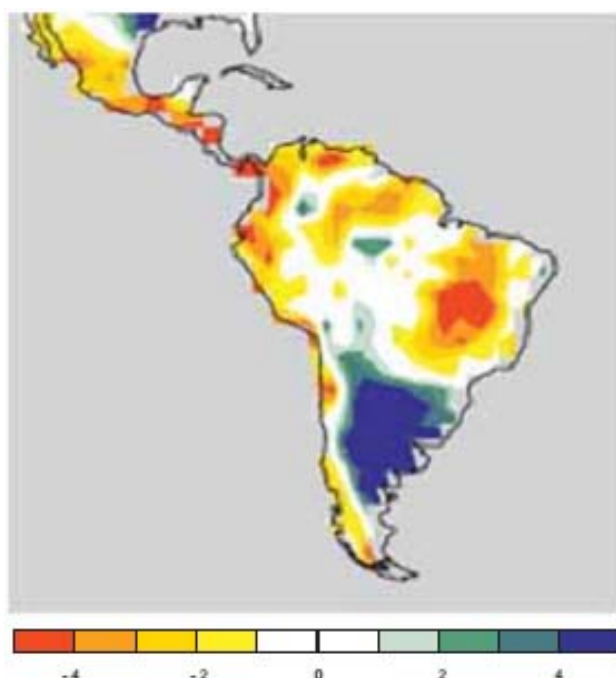


Figure 3. Overview of observed precipitation patterns in the LAC region during the period 1990–2002. The positive (blue) and negative (red) values of the index correspond to areas that are wetter or drier than the average³⁴.

18. Over the past three decades, the LAC region has experienced the climate-related effects of increased El Niño occurrences. During this time, two extreme El Niño cycles (1982/83 and 1997/98) and other **extreme events** – such as hurricanes – have occurred. These extreme events have contributed greatly to the increased vulnerability of people and cities to natural disasters such as floods, droughts and landslides. The El Niño Southern Oscillation (ENSO) will continue to influence the LAC climate, but changes in this frequency or intensity remain uncertain³⁵.

19. CA is a sub-region with an above average exposure to geo-climatic hazards such as earthquakes, volcano eruptions and hurricanes³⁶. In addition, the area has been identified as particularly vulnerable to climate change. For example, over the past 30 years there has been a steady increase in the frequency and severity of storms, floods and droughts³⁷. Moreover, a large percentage of the population in CA live on or near steep terrain with sandy, volcanic soils that are prone to landslides which are the main cause of destruction³⁸.

³⁴ Trenberth, K.E., et al. 2007. Observations: surface and atmospheric climate change. *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the IPCC. Cambridge, Cambridge University Press.

³⁵ Christensen, J.H., K. Krishna Kumar, et al. 2013: Climate phenomena and their relevance for future regional climate change. In: *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

³⁶ Economic Commission for Latin America and the Caribbean (ECLAC). 2010. *Economics of climate change in Latin America and the Caribbean*. UN, Santiago, Chile.

³⁷ Giorgi, F. 2006. Climate change hot spots. *Geophysical Research Letters*. 33: L08707.

³⁸ Restrepo, C., and Alvarez, N. 2006. Landslides and their impact on land-cover in the mountains of Mexico and Central America. *Biotropica*. 38: 446–457.

Table 3 shows a summary of a selection of extreme events experienced in the LAC region during the period 2004–2006.

Table 3. A selection of extreme events and their effects in the LAC region in the period 2004–2006³⁹.

Event/Date	Country/Impacts
Hurricane (H.) Beta: November 2005	In Nicaragua, this resulted in 4 deaths, 9,940 injuries, 506 homes damaged, 250 ha of crops and 240 km ² of forest destroyed and 2,000 artisan fishermen were affected (SINAPRED, 2006).
H. Wilma: October 2005	Mexico: Several landfalls occurred, mainly in the Yucatán Peninsula. Losses of US\$1,881 million and serious damage to ~95% of the tourist infrastructure was caused.
H. Stan: October. 2005	Guatemala, Mexico, El Salvador, Nicaragua, Costa Rica experienced losses of US\$3,000 million and more than 1,500 deaths. Guatemala was the most affected country, accounting for ~80% of the casualties and more than 60% of the infrastructure damage (Fundación DESC, 2005).
H. Emily: July 2005	Mexico – Cozumel and Quintana Roo experienced losses of US\$837 million. Tourism losses were estimated at US\$100 million; dunes and coral reefs were affected; 1,506 turtle nests were lost; and 1-4 m storm surges were experienced (CENAPRED-CEPAL, 2005).
Heavy rains: September 2005	Colombia: these rains resulted in ~70 deaths, 86 people injured, 6 people disappeared and ~140,000 flood victims (NOAA, 2005).
Heavy rains: February 2005	Venezuela: Heavy precipitation (mainly on central coast and in Andean mountains) resulted in severe floods and heavy landslides. IN addition, the heavy rains resulted in losses of US\$52 million, 63 deaths and 175,000 injuries (UCV, 2005; DNPC, 2005/06).
H. Catarina: March 2004	Brazil: This was the first hurricane to be observed in the South Atlantic (Pezza and Simmonds, 2005); It resulted in the damage of ~ 3,000 houses in southern Brazil (Cunha et al., 2004); led to severe flooding in eastern Amazonia and affected tens of thousands of people (http://www.cptec.inpe.br/).
Droughts: 2004-2006	Argentina – Chaco: Losses were estimated at US\$360 million; in 2004, 120,000 cattle were lost and 10,000 people evacuated (SRA, 2005). In 2004/05 Bolivia and Paraguay were similarly affected. Brazil-Amazonia: Severe drought affected central and south-western Amazonia, which is probably associated with warm sea surface temperatures in the tropical North Atlantic (http://www.cptec.inpe.br/). Brazil – Rio Grande do Sul: Reductions of 65% and 56% in soybean and maize production were experienced (http://www.ibge.gov.br/home/).

The Caribbean

20. During the period 1900–2000, **rainfall** consistently declined by ~0.2 mm per year. It is anticipated that this trend will continue under the future climate change scenarios^{40,41}.

21. In the period 2000–2009, 39 hurricanes occurred in the Caribbean region compared with 15 and 9 between 1980–1990 and 1990–2000 respectively. The economic loss from these hurricanes – which have had a negative effect on the population and the economies in

³⁹ IPCC Fourth Assessment Report: Climate Change 2007. Available online at: http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch13s13-2-2.html

⁴⁰ The accumulation of greenhouse gases and absorption of radiation has resulted in an atmospheric warming that is faster in the Caribbean than elsewhere in the tropics. This is related to a local acceleration of the Hadley cell and gas plumes that drift west from Africa, producing a drying trend that is projected to continue in the 21st century. Reference: Jury, M. 2010. Long-Term Variability and Trends in the Caribbean Sea. *International Journal of Oceanography*.

⁴¹ MONA. 2012. State of the Jamaican Climate. Available online at: <http://www.mona.uwi.edu/physics/sites/default/files/physics/uploads/SOJC-policy-maker-summary.pdf>. Accessed 12 August 2015.

general – was ~US\$14 billion⁴². From 1985 to 2000, beaches were eroded at an average rate of ~0.5 m per year in eight Caribbean islands⁴³. Moreover, greater erosion rates were positively correlated with the destructive impact of hurricane events⁴⁴. Over the last 60 years, the mean annual rate of Sea Level Rise (SLR) in the Caribbean region was ~2 mm per year, similar to the global average⁴⁵. In Jamaica, sea level measurement at Port Royal between 1955 and 1971 indicate a 0.9 mm/year rising trend⁴⁶.

Regional climate change predictions and future climate change effects

Latin America

22. Table 4 summarises the predicted effect of climate change for Latin America. By 2100, the projected trend indicates a temperature increase across the region by an average of 2.5°C and 4°C for CA and SA respectively compared with the year 2000.

23. Rainfall patterns are projected to become more variable. In particular, the total amount of rainfall is predicted to reduce considerably by: i) between 10 and 50% for CA; and ii) ~20% for the west coast of SA, an area that is already relatively dry. By contrast, it is predicted that the south-eastern coast of SA – Brazil – will experience an increase in precipitation of ~25%. However, south of the 20°S latitude, the duration and frequency of droughts have increased and these effects will continue into the future. At this latitude, increased rainfall will result in over a shorter period.

24. In El Salvador, by 2100, the Metropolitan Area of San Salvador (AMSS) will experience a greater intensity and frequency of extreme events, including: i) intense rainfall over a shorter period; ii) longer, drier periods; and iii) heat waves. These effects will result in considerable expenditure within the state budget. For example, three tropical storms recently caused losses and damages to basic infrastructure worth ~US\$1.3 billion (~6% of the GDP in 2011)⁴⁷. Consequently, the livelihoods of the people in the AMSS are negatively affected by climate change.

Table 4. Summary of regional projected changes in temperature, precipitation and climate extremes for different sectors of Central America (CA) and South America (SA)⁴⁸.

Region	Projected effect	Sectoral vulnerability	References
--------	------------------	------------------------	------------

⁴² Economic Commission for Latin America and the Caribbean (ECLAC). 2010. Economics of climate change in Latin America and the Caribbean. UN, Santiago, Chile.

⁴³ These islands included Anguilla, Antigua, Barbuda, Dominica, Grenada, Montserrat, Nevis and St Kitts are located in the eastern Caribbean.

⁴⁴ Cambers, G. 2009. Caribbean beach changes and climate change adaptation. *Aquatic Ecosystem Health and Management*. 12:168–176.

⁴⁵ Palanisamy H. et al. 2012. Regional sea level change and variability in the Caribbean Sea since 1950. *Journal of Geodetic Science*. 2: 125–133.

⁴⁶ MONA. 2012. State of the Jamaican Climate. Available online at: <http://www.mona.uwi.edu/physics/sites/default/files/physics/uploads/SOJC-policy-maker-summary.pdf>. Accessed 12 August 2015.

⁴⁷ GOES/CEPAL. 2011. Evaluación de daños y pérdidas en El Salvador ocasionados por la depresión tropical 12E. San Salvador, El Salvador: Gobierno de El Salvador (GOES) - Comisión Económica para América Latina (CEPAL).

⁴⁸ Magrin, G.O., J.A. Marengo, J.-P. Boulanger, et al. 2014. Central and South America. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 1499–1566.

CA (in this case including Mexico) and northern SA	<p>Air temperature</p> <ul style="list-style-type: none"> • By 2100, an increase of 2–4°C is expected. • By 2100, within cities an increase in temperature of ~2.5–5°C is predicted as a result of the urban heat island effect 	<p>Water</p> <ul style="list-style-type: none"> • Increasing temperatures lead to increased evaporation of water sources thereby affecting water quantity. <p>Health</p> <ul style="list-style-type: none"> • Increased temperatures in cities as a result of the urban heat island effect – will particularly affect children and the elderly because they are more prone to dehydration and heat strokes. <p>Food</p> <ul style="list-style-type: none"> • Increasing temperatures reduce the yield of main crops such as beans, maize and coffee. 	Aguilar et al., 2009; Karmalkar et al., 2011.
	<p>Precipitation:</p> <ul style="list-style-type: none"> • By 2100, a reduction in rainfall of ~10 to 48% is predicted. 	<p>Water</p> <ul style="list-style-type: none"> • Reduced precipitation leads to a reduction of ~20% in inflows to major reservoirs. • Reduced precipitation negatively affects the water availability for household and agricultural use. <p>Food</p> <ul style="list-style-type: none"> • Crop yields of wheat will be reduced as a result of water limitations. • Reduced water availability may lead to reduced water quality because of the need for salinisation. <p>Health</p> <ul style="list-style-type: none"> • Intense rainfall results in the risk of sewage overflow. • Reduced rainfall affects water quality, which affects drinking water and increases the risk of water-borne diseases. <p>Urban settlements</p> <ul style="list-style-type: none"> • An increase in precipitation increases the risk to flooding within cities. 	Karmalkar et al., 2011; Giorgi and Diffenbaugh, 2008.
	<p>Extreme events</p> <ul style="list-style-type: none"> • An increase in frequency and intensity of hurricanes. • Sea level rise of ~2– 	<p>Urban settlements</p> <ul style="list-style-type: none"> • An increase in hurricanes and sea level rise increases the risk of flooding and consequent damage to infrastructure and livelihoods. 	Romero-Lankao et al., 2012a; Krellenberg et al., 2013.

	5 mm per year.		
--	----------------	--	--

Caribbean

25. In the Caribbean, from October to March, precipitation is projected to: i) decrease in the south; and ii) increase in the north. Table 5 shows the projected effects and vulnerability per sector to climate change.

Table 5. Projected effects and vulnerability per sector to climate change in the Caribbean.

Effect	Sectoral vulnerability	Reference
<p>Precipitation</p> <ul style="list-style-type: none"> • By 2100, an annual reduction in rainfall of 5-12% is predicted compared with the 1980-1999 baseline. • Reduced groundwater levels will result in salt-water intrusion from the ocean. • In the southern Caribbean, drier conditions will occur particularly during the traditional wet season from June to October. • Rainfall will increase during the latter part of the wet season from November to January in the northern Caribbean (i.e., north of 22°N). 	<p>Water</p> <ul style="list-style-type: none"> • Reduced rainfall puts pressure on the freshwater availability for household and agricultural use. • Watersheds in high volcanic and granite islands have limited storage capacity. • Reduced precipitation negatively affects the water availability for household and agricultural use. <p>Urban settlements</p> <ul style="list-style-type: none"> • An increase in precipitation – as a result of increased rainfall variability – increases the risk to flooding within cities. 	<p>Cashman et al., 2010; WG1 AR4 Table 11.1; Whyte et al, 2008; Campbell et al., 2011; Taylor et al., 2013; Prospero and Lamb, 2003.</p>
<p>Temperatures</p> <ul style="list-style-type: none"> • By 2100, an increase in temperature across the Caribbean of 1°C to 4°C is predicted compared to a 1960–1990 baseline. • By 2100 An annual increase of sea surface temperature is predicted of ~1.5–2°C. • In the Sahel, drought conditions result in more dust particles being transported across the ocean towards the Caribbean. 	<p>Health</p> <p>The Caribbean is vulnerable to the following diseases because of increased temperatures:</p> <ul style="list-style-type: none"> • Leptospirosis. • Ciguatera fish poisoning (CFP) as a result of fish consumption. • Dust particles increase the incidence of asthma and other respiratory diseases. • Increased temperatures in cities as a result of the urban heat island effect – will particularly affect children and the elderly because they are more prone to dehydration and heat strokes. <p>Food</p> <ul style="list-style-type: none"> • Increased sea temperature results in the bleaching of coral reefs and a reduced availability of food for the 	<p>Morrison et al, 2008; Tester et al, 2010.</p>

	<p>fish. This leads to a decreased fish population and a consequent reduction in food availability for people.</p> <p>Tourism</p> <ul style="list-style-type: none"> Increased sea temperature results in the bleaching of the coral reefs and reduced availability of food for the fish. This leads to a decrease in the fish population, which affects the Scuba diving and snorkelling industry. 	
<p>Extreme events</p> <ul style="list-style-type: none"> Sea level rise of ~5 mm per year is predicted. Northerly swells will result in high-amplitude waves that affect the leeward coasts of the islands. 	<p>Urban settlement</p> <ul style="list-style-type: none"> Rapid population growth in combination with limited accommodation space results in people settling in the more vulnerable locations of the islands. Increased swells cause damage to coastal infrastructure. <p>Tourism</p> <ul style="list-style-type: none"> Beach erosion. Damage to accommodation and tourism sites. 	<p>Connell, 2012; Scott et al., 2012c; Bush et al., 2009; Cambers, 2009.</p>

Urbanisation

26. In the LAC region, the effects of climate change are already noticeable in the urban areas. For example, in 2007, floods in Villahermosa, Mexico covered two-thirds of the state and resulted in damages and losses equivalent to ~30% of the state's annual GDP⁴⁹. Local communities with inadequate housing experienced the greatest losses as a result of these floods. In 2010, ~27% of the urban population in the LAC region lived in marginal housing and in areas vulnerable to extreme events⁵⁰.

27. Figure 4 shows a positive correlation between the urbanisation rate⁵¹ of areas and a temperature increase over the last century. Areas that have experienced the fastest rate of urbanisation and temperature increase include Asia, Western sub-Saharan Africa, Mexico, the Caribbean and SA. An increase in temperature creates an "urban heat island" effect, whereby the heat of the sun is captured in the city. As a result, the temperature within the city is considerably higher than the surrounding areas. This "urban heat island" effect has negative consequences on the health of people, particularly the poor and elderly as they have limited resources to adapt to the changing conditions.

⁴⁹ Economic Commission for Latin America and the Caribbean (ECLAC). 2009. Statistical Yearbook for Latin America and the Caribbean 2008. United Nations.

⁵⁰ UN-Habitat. 2010. State of the world's cities 2010/2011: bridging the urban divide.

⁵¹ Urbanisation is defined here as the process of people migrating from rural areas to the city.

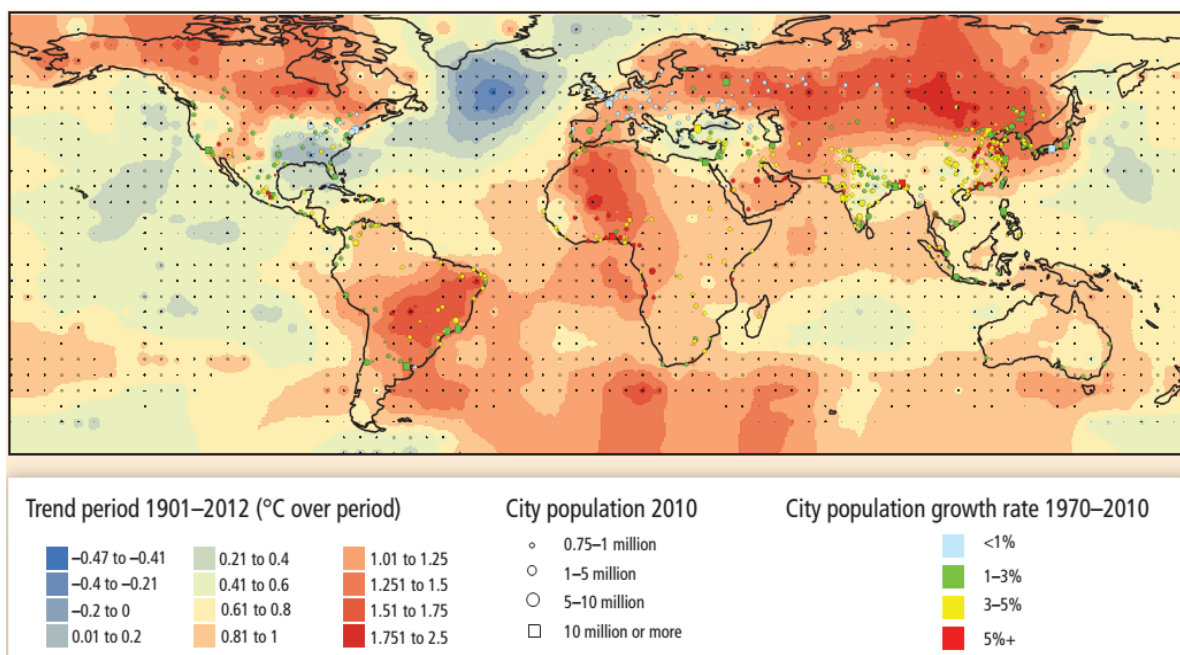


Figure 4. Large urban agglomerations in 2010 with observed climate change, during the period 1901–2012⁵².

28. Figure 5 shows the scenario of a continued status quo of GHG emissions. Under this scenario, by 2100, the majority of medium-sized cities will experience an average increase of at least ~2.5°C compared with the current temperature.

⁵² Revi, A., Satterthwaite, D.E. and Aragon-Durand, F. 2014. Urban Areas. In: WGII Climate Change 2014: Impacts, Adaptation, and Vulnerability. IPCC Working Group II Contribution to AR5. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 535–612.

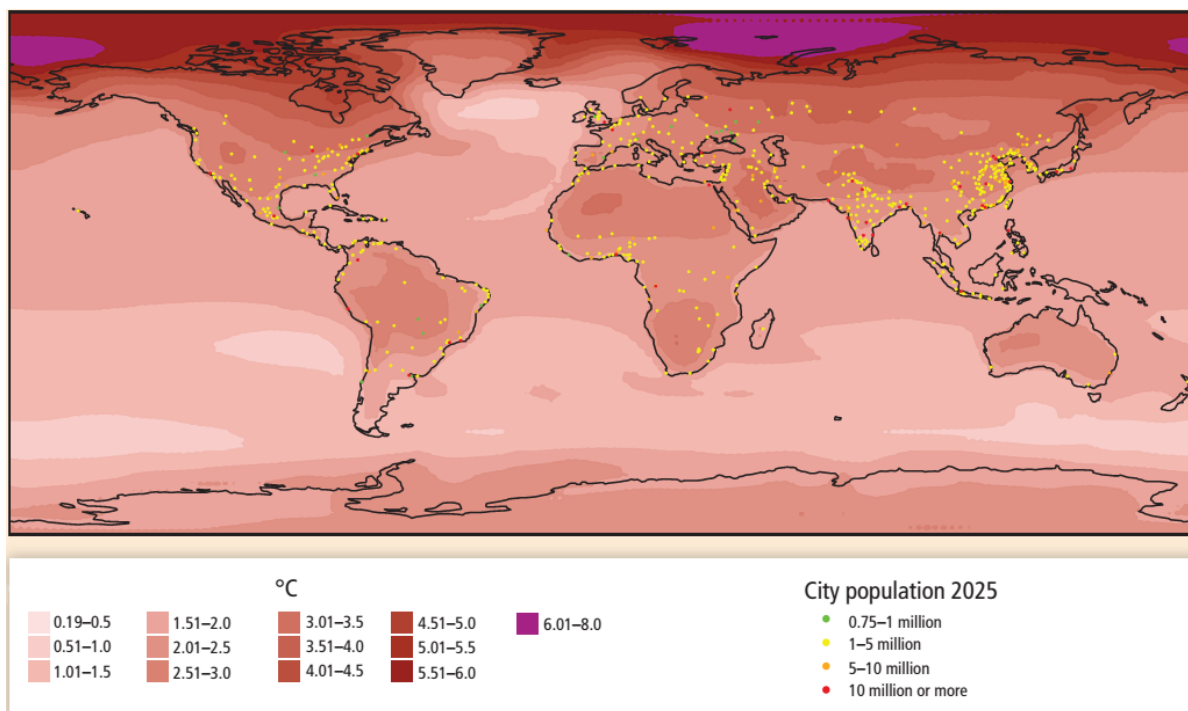


Figure 5. Large urban agglomerations in 2025 with projected climate change for the mid-21st century using the scenario RCP8.5.

2.2. Global significance

29. SCCF-financed projects are not required to comply with the global significance criteria. However, this SCCF-financed project will contribute towards several global benefits. For example, the project will maintain significant biodiversity and ecosystem goods and services through the reforestation and rehabilitation of wetlands and riparian areas. The project will also promote the collective management of local water systems that contribute to sustainable use and maintenance of ecosystem services. Several co-benefits will be provided by the project. For example, well-designed, implemented and monitored urban EbA interventions will contribute to the: i) generation of additional livelihoods, such as urban agriculture; ii) improvement of the health of people in cities by filtering air pollution and reducing the “urban heat island” effect; iii) reduction of flooding through permeable pavements and the creation of water storage points; and iv) sequestration of carbon dioxide in these areas, thereby reducing the effect of cities on global climate change⁵³. These EbA interventions will benefit different sectors, including those related to water management, infrastructure and tourism. In addition, the sharing of information on lessons learned and benefits accrued on urban EbA – within countries and across the LAC region – will promote the replication and upscaling at the national, regional and global level.

2.3. Threats, root causes and barrier analysis

30. Climate-induced threats in the LAC region are described in Section 2.1. The section below describes the non-climate related threats in the LAC region.

⁵³ Available online at: http://www.unep.org/urban_environment/PDFs/Brochure_Climatechange.pdf. Accessed on 25 February 2015.

Non-climate change related threats in Latin America and the Caribbean

Poverty

31. Cities in the LAC region – like elsewhere in the world – attract rural people looking for work. However, job availability in cities in the LAC region does not meet the demand for work from increasing numbers of migrant workers. This has resulted in high unemployment rates, low household income levels and widespread poverty in these cities. In addition, urban communities no longer have access to traditional work opportunities to sustain livelihoods during times of hardship. For example, areas in/near to urban settlements are often not suitable for growing crops. Community members thus have little opportunity for generating income and consequently do not have the financial resources to cope with a wide range of climate and non-climate related threats.

Uncoordinated urban planning

32. Urbanisation – particularly within the medium-sized cities in the LAC region – often results in the spread of settlements into areas that are not designated for housing by the local government. This tends to happen when planners in such cities have not anticipated and made provision for rapid urbanisation within an urban development plan. As a result, these settlements generally: i) are overcrowded; ii) do not have adequate housing, drainage and sewage infrastructure; and iii) are located in marginal areas. Such settlements are often at risk to the effects of climate change. For example, intense rainfall events result in floods when the drainage infrastructure does not have the capacity to handle the rate of precipitation.

Reduced water availability and quality

33. Maintaining a consistent quality and quantity of water supply to a city – including the associated costs of transport and water treatment – depends strongly on the management of the city's watersheds. In addition, management of watersheds is important for reducing the impacts of *inter alia* flooding and water pollution. However, there is currently limited recognition among policy- and decision-makers in El Salvador, Jamaica and Mexico of the importance of watershed protection to maintain water supplies as well as reduce flooding and water pollution in urban areas. While most urban watersheds⁵⁴ in the LAC region are still covered with forests, these are increasingly being replaced by cropland and pastures⁵⁵. Because of the shallower root system of crops compared with trees, the infiltration rate and water holding capacity of the soil in cropland is reduced relative to in forested watersheds. As a result, there is increased runoff of surface water with associated erosion of sediments into rivers and streams. The water and sediments are transported downstream to cities and consequently negatively affects water quality and increases the risk of flooding. This is particularly the case for cities located in mountainous areas such as San Salvador and Xalapa.

34. In San Salvador, Kingston and Xalapa – and many other cities in the world – the conversion of landscapes from rural to urban areas results in the replacement of ecosystems by hard infrastructure, such as paved roads and concrete buildings. This conversion is

⁵⁴ An urban watershed is here a watershed with a city within its boundaries.

⁵⁵ McDonald, R.I. & Shemie, D. 2014. Urban Water Blueprint: Mapping conservation solutions to the global water challenge. The Nature Conservancy: Washington, D.C.

known as “catchment hardening” and has considerable effects on hydrology⁵⁶. For example, water from rainfall does not infiltrate into the soil to recharge groundwater levels and/or aquifers. Instead, the rainwater is intercepted by the hard surfaces and is usually redirected into storm water systems or remains pooled in paved areas. As a consequence, catchment hardening can result in reduced rates of aquifer recharge as well as an increased risk of flooding in paved areas.

35. An increase in the urban population results in a greater demand for water from limited water resources, such as aquifers. Consequently, these water resources become overexploited leaving a smaller volume of water available to each person for cooking, washing and sanitation. The overexploitation of fresh water aquifers underneath or nearby cities also leads to the subsidence of the ground. This causes damage to buildings and economic infrastructure, thereby jeopardising the housing conditions and livelihoods of the urban communities⁵⁷. In coastal cities – such as Kingston – increased extraction of groundwater is resulting in saltwater intrusion into fresh groundwater under the city thereby reducing the water quality for drinking and agriculture⁵⁸.

36. In fast growing medium-sized cities – including San Salvador, Kingston and Xalapa – insufficient maintenance or limited provision of drainage systems in unplanned settlements results in the overflowing of wastewater during heavy rains. This wastewater consequently affects the quality of surface water that urban communities use for drinking, washing and other household uses⁵⁹. A reduction in the water quality increases the incidence of water-borne diseases thereby affecting the health of the urban communities.

Limited food availability

37. Two main global developments affecting land use in Latin America⁶⁰ include an increased demand for: i) cattle ranging for beef production, which requires a higher hectare per kg food ratio than crops; and ii) bio-fuels and export crops, particularly soybeans. Because of the higher value per hectare, cattle ranging and bio-fuel production outcompete crop production for the use of land. Since the 1970s, the forest area in CA has been reduced by ~40% and replaced with pasture areas for cattle ranging⁶¹. The expansion of cities – such as San Salvador, Kingston and Xalapa – into surrounding peri-urban areas also results in the replacement of natural ecosystems and/or agricultural land with urban infrastructure. Consequently, a reduced area for agriculture causes increased food prices⁶². Moreover, less land is available for poor urban communities to grow crops as an alternative to buying food. An increasing urban population also adds pressure to re-allocate water from the agricultural

⁵⁶ Hayhoe, S.J. et al. 2011. Conversion to soy on the Amazonian agricultural frontier increases streamflow without affecting storm flow dynamics. *Global Change Biology*. 17:1821–1833.

⁵⁷ Romero Lankao, P. (2007), op. cit.; Connolly, Priscilla (1999), Mexico City: our common future? *Environment and Urbanization*. 11: 53–78.

⁵⁸ Cashman, A., Nurse, L, and J. Charlery. 2010. Climate change in the Caribbean: The water management implications. *Journal of Environment and Development*. 19: 42–67.

⁵⁹ Smith J.B. et al. 2011. Coping with climate variability and climate change in La Ceiba, Honduras. *Climatic Change*. 108: 457–470.

⁶⁰ Grau, H. and Aide, M. 2008. Globalisation and land-use transitions in Latin America. *Ecology and Society*. 13: 16.

⁶¹ FAO. Livestock Policy Brief 3. Cattle ranging and deforestation. Available online at: <http://www.fao.org/3/a-a0262e.pdf>.

⁶² Sathertwaithe, D. et al. 2010. Urbanization and its implications for food and farming. *Philosophical transactions of the royal society*. 365: 1554.

sector to the drinking water supply in cities, further hampering food production⁶³. This contributes to the food insecurity of poor urban communities as they spend more than half of their income on basic food purchases⁶⁴, which makes them sensitive to price fluctuations.

Health problems

38. Urbanisation has considerable ramifications on the health of communities, particularly the poor. For example, people in cities live in close proximity to one another, thereby speeding the spread of vector borne⁶⁵ and waterborne⁶⁶ diseases. These diseases are exacerbated by limited sanitation and municipal solid waste management. Urban communities are also likely to experience the negative effects from heat because of less vegetation in cities than in rural areas⁶⁷. Currently, buildings and asphalt in roads absorb most solar energy in cities. This absorbed energy is not used, but is re-radiated by these buildings and roads to create an “urban heat island” that results in higher temperatures in the city than outside the city⁶⁸. This urban heat island effect can lead to heat exhaustion and mortality⁶⁹, with consequences for quality of life and economic activity. Less vegetation and increased numbers of cars and industries compared with rural areas also contribute to air pollution, which has detrimental effects on the respiratory system of the people in cities.

Natural disasters

39. The expansion of urban infrastructure and agriculture has resulted in the clearing of land in the peri-urban areas of San Salvador, Kingston and Xalapa, which is degrading ecosystems such as wetlands and forests⁷⁰. A decrease in the extent of these ecosystems results in a reduction of the ecosystem services provided to the city. Many of these ecosystem services provide a protection and buffering function for cities from natural disasters⁷¹. For example, forests on slopes bind the soil to protect cities against landslides and coastal marshes buffer the energy of storm surges. Similarly, unsustainable land-use practices – such as overgrazing and the use of inappropriate agricultural techniques – in watersheds result in: i) increased erosion; ii) reduced water infiltration; and iii) increased potential of floods in the cities⁷².

40. In the LAC region, natural disasters such as earthquakes, hurricanes and volcano eruptions are considerable risks in many areas. Poor communities in cities are most vulnerable since they have limited capacity and resources to prepare for and respond to

⁶³ UN. 2012. Water and a Green Economy in Latin America and the Caribbean (LAC). UNECLAC Natural Resources and Infrastructure Division and the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC).

⁶⁴ Cohen, M.J. & Garrett, J.L. 2010. The food price crisis and urban food (in)security. *Environment and urbanization*. 22: 467–482.

⁶⁵ Particularly dengue, malaria and Chikungunya.

⁶⁶ These include *inter alia*: Cholera, Dysentery and Typhoid.

⁶⁷ Vegetation uses solar energy for growth, evaporates the remaining energy and consequently does not contribute to the warming up of the city.

⁶⁸ <http://www.epa.gov/heatisland/>, Accessed on 4 March 2015.

⁶⁹ Deschenes, O. 2013. Temperature, human health, and adaptation: A review of the empirical literature. National Bureau of Economic Research. In preparation for the Integrated Assessment Modeling Conference, May 17-18 2012, Cambridge MA.

⁷⁰ Grau, H. and Aide, M. 2008. Globalisation and land-use transitions in Latin America. *Ecology and Society*. 13: 16–31.

⁷¹ Munang, R. et al. 2013. Climate change and Ecosystem-based Adaptation: a new pragmatic approach to buffering climate change impacts. *Current Opinion in Environmental Sustainability*. 5: 1–5.

⁷² Satterwaite, D. et al. 2007. Adaptation to climate change in urban areas: the possibilities and constraints in low-and middle-income nations. IIED.

these disasters. This vulnerability of poor communities to natural disasters is exacerbated by poor urban communities: i) building of inadequate housing; ii) settling in high-risk areas thereby increasing exposure to the disasters; and iii) having limited awareness on how to reduce the risk of or respond to natural disasters.

Non-climate change related threats specific to the SCCF pilot cities

This section describes the non-climate related threats for the pilot city in the selected countries. See Appendix 1, 2 and 3 for a map and more background information of the countries and selected cities.

San Salvador, El Salvador

Natural disasters

41. Because of its location on the fault line of the Cocos and Caribbean tectonic plates, the Metropolitan Area of San Salvador (AMSS) is vulnerable to earthquakes⁷³ as well as eruptions of the San Salvador volcano⁷⁴. In addition, the soil in and around the AMSS is volcanic and has limited capacity for water infiltration. During heavy rainfall, the slopes of the mountains and volcano are therefore susceptible to erosion, which results in landslides and flooding in the city. Consequently, urban communities in the AMSS are particularly vulnerable to natural disasters.

Uncoordinated urban planning and settlement

42. In the last decade, San Salvador's expansion has not been adequately coordinated, as policymakers for the five-year urban development plan did not anticipate the rapid urbanisation rate⁷⁵. Furthermore, the urban development plan of San Salvador does not include the management of watersheds in the AMSS⁷⁶. As a result, the expansion of urban infrastructure is taking place on agricultural land, steep ravines and the slopes of the San Salvador volcano and contributes to deforestation in these areas. Because of the poor water infiltration of the soil, heavy rainfall causes erosion and instability. Consequently, urban communities on the slopes and at the foot of the volcano are becoming increasingly vulnerable to landslides and flooding. This vulnerability is exacerbated by poor housing construction and inadequate design of drainage systems. As a result, these natural disasters and poor urban planning are affecting the provision of ecosystem services to the city. In addition, the expansion of urban infrastructure into agricultural areas is jeopardising the implementation of the city's food production strategy⁷⁷.

Waste management

43. In 2006, San Salvador produced ~1,800 tonnes of solid waste daily, which corresponds to ~55% of the national production. Of this waste, ~77% is collected and the remaining ~23% is dumped illegally. Currently in the AMSS, there is only one landfill located in Nejapa, in which the waste of 22 municipalities is deposited. This landfill site – administered by Manejo Integral de Desechos Sólidos (MIDES) – is well managed as it has

⁷³ <http://earthquaketrack.com/p/el-salvador/recent>.

⁷⁴ The last major eruption was on 6 June 1917 and in 1999 a small eruption occurred as result of an earthquake ~5 kilometres from the volcano.

⁷⁵ Rajack, R. and Williams, K. 2012. Expanding land supply in rapidly urbanizing El Salvador. A Latin American success. World Bank, sustainable development department.

⁷⁶ Personal communication with B. Fernandez during Nacional Workshop on 25 March 2015.

⁷⁷ National Strategic Plan for Food Security and Nutrition (2013–2016).

environmental permits, adequate supervision and proper management, including leachate⁷⁸ recirculation to prevent groundwater pollution. However, the waste that is dumped illegally is not treated and results in *inter alia*: i) increasing pollution of water sources in the city; ii) an increased occurrence of gastrointestinal and vector-borne diseases; and iii) reduced water flow in storm water drains and natural waterways as a result of obstruction.⁷⁹

Kingston, Jamaica

Natural disasters

44. Jamaica is located in a region prone to hurricanes and earthquakes (see Section 2.1). The dredging activities at the Kingston Container Terminal (KCT) and the expansion of the port of Kingston have resulted in the removal of mangroves and sea grass beds, that previously acted as a buffer against hurricanes. Without this buffer, the vulnerability of Kingston's urban population to hurricanes has increased. In particular communities along the waterfront corridor – already living under poor housing conditions – are more exposed to the impacts of hurricanes following the removal of mangroves and sea grass beds.

Uncoordinated urban planning and settlement

45. The socio-economic development of the Kingston Metropolitan Area (KMA) is hindered by: i) unplanned construction of settlements by migrants and other poor communities in the city; ii) limited enforcement of urban planning regulations; and iii) overcrowded settlements as a result of increased migration. The majority of urban communities are consequently found in the informal settlements of the inner city of the KMA. These urban communities often have limited basic infrastructure and services – such as adequate water supply and roads – to support their daily activities.

Waste management

46. In the KMA, the main sources of freshwater are groundwater and surface water from rivers. Ongoing urbanisation has resulted in the wells that supply the city becoming contaminated through the improper disposal of sewage. Sewage was – and in some cases still is – disposed of in soakaway pits⁸⁰. Rainwater then carries nitrate ions and pathogens originating from the sewage into the groundwater, which elevates these concentrations and results in the water failing to meet drinking water standards. This process has caused several wells to be abandoned– including the Trench Town, Cockburn Pen and Cavaliers. In addition, as a result of population growth, new potable water has had to be sourced for the city from the Yallahs/Negro Rivers and Rio Cobre scheme – such as the Tulloch Spring and Bog Walk wells⁸¹. The water quality in Kingston is also reduced through the overexploitation of fresh water from aquifers – as a result of increased water consumption – which has resulted in saltwater intrusion into these aquifers⁸².

47. Currently, ~50% of the solid waste generated in Jamaica originates from the KMA⁸³. However, there is limited awareness among the general public in the KMA of the importance of hygienic waste management practices, which results in the proliferation of illegal

⁷⁸ Leachate is the liquid that drains or 'leaches' from a landfill.

⁷⁹ MARN – RTI International, 2006 Segundo Censo Nacional de Desechos Sólidos Municipales.

⁸⁰ Soak away pits are underground covered, porous-walled chambers that allow water to slowly soak into the ground.

⁸¹ B. Fernandez. Personal Communication. 18 March 2015.

⁸² Saltwater intrusion is the movement of saline water into freshwater aquifers, which can lead to contamination of drinking water sources.

⁸³ <http://www.nepa.gov.jm/policies/nap/waste.htm>. Accessed 26 March 2015

dumpsites. In addition, official waste disposal sites contribute to the air, soil and water pollution as they have insufficient or inadequate equipment for the treatment and burial of solid waste. This results in the pollution of groundwater and increases the risk of water-borne diseases – such as dengue, malaria and typhoid.

Xalapa, Mexico

Natural disasters

Xalapa is located on the Trans Mexican Volcanic Belt, one of the most active geological areas in Mexico. There are several monogenetic⁸⁴ volcanos within and surrounding the Xalapa Metropolitan Area (XMA). The area of these monogenetic volcanoes – west of the XMA – is considered as high volcanic risk, while the rest of the city is considered to have medium volcanic risk. In addition, the XMA is at medium risk of earthquakes, but at high risk of landslides, particularly the areas to the north-west and south of the city. The areas surrounding the Sedeño and Carneros Rivers – to the north, north-east and south of the city – are in danger of soil liquefaction⁸⁵ caused by earthquakes, which reduces the ability of the soil to support the foundation for buildings and other infrastructure. Consequently, the zone between these two rivers is vulnerable to mass movement and slope processes⁸⁶.

Uncoordinated urban planning and settlement

48. During the period 1980 to 2010, the XMA expanded from 917 to 7,977 hectares⁸⁷. The current demand for land by the city's growing population exceeds the availability of land that is suitable for urban development. As a result, the city's expansion has taken place in unsuitable areas. For example, new settlements are established in recently deforested or steep areas that are vulnerable to natural disasters such as hurricanes, floods and landslides. These settlements are also often poorly constructed as migrants have limited financial resources to build adequate and safe housing. In addition, the provision of sanitation and drainage services to these areas is often expensive and is consequently not undertaken by the relevant authorities. The absence of these services further contributes to the vulnerability of urban communities to diseases and natural disasters.

Poverty

49. In 2010, Xalapa had ~670,000 inhabitants of which ~45% earned an income below the national average of US\$412 per month. Of this group, ~13% had either no income or an income below the minimum wage of US\$140 per month. Consequently, a relatively large percentage of Xalapa's population lives in poverty, which has contributed to increased social inequality in the city⁸⁸. The level of poverty is exacerbated by the low level of education, as ~24% of the population above the age of 12 have not completed primary education⁸⁹. The gap between current levels of education and the education requirements of employment opportunities has major consequences for the potential livelihoods of many members of the urban population who encounter difficulties in entering the job market. As a result, these people often remain unemployed with little household income. Besides limited education,

⁸⁴ These volcanos only erupt once compared with to polygenetic volcanos that erupt multiple times.

⁸⁵ Liquefaction occurs in saturated soils, whereby the space between individual particles is filled with water. This water exerts a pressure on the arrangement of soil particles. The shaking of the earthquake can increase the water pressure to the point where the soil particles cannot move independent of each other.

⁸⁶ Secretaría de Protección Civil del Estado de Veracruz. Sistema Integral de Atlas de Riesgos de Veracruz.

⁸⁷ Plan de Acción Xalapa Sostenible. BID. 2014.

⁸⁸ CONEVAL. 2012. Informe de pobreza y evaluación en el estado de Veracruz 2012. México, D.F.

⁸⁹ National Institute for Statistics and Geography. 2010. Censo de Poblacion y Vivienda 2010.

poverty levels are also increased by limited: i) access to financial resources such as microfinance opportunities; and ii) opportunities to produce goods to sell to the market.

Water and waste management

50. The XMA is located over one of the largest aquifers in the country⁹⁰. In addition, the city receives surface water through the Pixquiac tributaries as well as through the water supplied by the Colibries dam in Quimixtlan. Despite the large availability of water, there is limited infrastructure to support its distribution. For example, ~40% of the water that is available for distribution is lost through leakages resulting from failing infrastructure. Currently, the demand for water exceeds the supply. This demand is such that during dry periods, the city has to rotate the water supply to ensure an equal distribution⁹¹.

51. Drainage and sewage systems in the XMA only reach ~70% of the community. Of the waste water passing through these systems, ~45% is untreated and contributes to the pollution of urban streams⁹² such as the Sedeño River. This pollution is exacerbated by the disposal of solid waste in streams. The dumping of solid waste into the natural waterways, drainage and sewage systems also increases the risk of flooding in the city through the blocking of such systems.

Preferred solution

52. Uncoordinated urban planning and development, poverty and poor waste management are threats that increase the vulnerability of communities in San Salvador, Kingston and Xalapa to natural disasters – including flooding, landslides and vector- and waterborne diseases. Furthermore, these threats result in environmental degradation and consequently the provision of ecosystem goods and services on which urban communities rely. The present and future effects of climate change (as described in Section 2.1) – particularly floods and droughts – will exacerbate these threats and further increase the vulnerability of urban populations. Government authorities and urban communities currently have limited technical capacity and financial resources to adapt and reduce their vulnerability to the negative effects of climate change. Therefore, the problem that the SCCF-financed project will address is that urban communities in the LAC region are vulnerable to the present and future effects of climate change that exacerbate environmental pressures.

53. The preferred solution is **to reduce the vulnerability of urban communities in LAC countries to climate change by catalysing a region-wide integration of Ecosystem-based Adaptation (EbA) into urban planning**. This will be achieved through:

Strengthened institutional capacity of local government in cities to integrate EbA into urban development plans

54. The preferred solution is to strengthen the institutional capacity of local government in cities in the LAC region to integrate climate change adaptation – including EbA – into urban development plans. To achieve this, local and national government would have: i) increased awareness on EbA interventions; ii) frameworks to share technical information on EbA with stakeholders from different sectors; iii) programmes to train other government authorities on

⁹⁰ Interamerican Development Bank. 2015. Xalapa Sostenible: Plan de Acción.

⁹¹ This rotation is possible as all operating systems are interconnected and able to share water resources.

⁹² Interamerican Development Bank. 2015. Xalapa Sostenible: Plan de Acción.

EbA; iv) strategies to upscale the implementation of urban EbA; and v) sustainable financing mechanisms to support the replication and upscaling of EbA in other cities. Strengthened institutional capacity would result in the development of effective and integrated urban development plans that promote the overall ecological and social sustainability of cities⁹³. The preferred solution would also include government departments – particularly those responsible for urban planning, water, transport and environment – collaborating with the private sector and research institutions to develop and implement appropriate urban EbA interventions⁹⁴. In addition, local government and urban communities would coordinate planning and implementation of urban adaptation interventions to adapt to the effects of climate change.

Enhanced technical capacity of local government and urban communities to implement EbA to respond to climate change

55. The preferred solution is to strengthen the technical capacity of local government and urban communities in the LAC region to plan and implement adaptation interventions, particularly EbA. This would be achieved through a combination of workshops and on-the-job training. As a result, local government would have enhanced technical knowledge to: i) design and prioritise appropriate EbA interventions; ii) develop protocols and technical guidelines on planning, implementing and monitoring urban EbA; and iii) implement urban EbA interventions.

Urban EbA interventions implemented across the LAC region

56. EbA provides a cost-effective way to reduce the vulnerability of urban communities to the effects of climate change while providing multiple co-benefits to these communities and the environment, by protecting, maintaining and rehabilitating ecosystems⁹⁵. Similarly, the protection of urban and peri-urban ecosystems would provide such benefits while reducing the vulnerability of urban communities to the effects of climate change. The preferred solution is therefore to implement EbA interventions across the LAC region to increase the capacity of poor urban communities to adapt to the effects of climate change. These urban EbA interventions would be implemented at the watershed, urban landscape and household scales⁹⁶, with a strong link between the interventions across all three scales. This link between scales will increase the effectiveness and scope of interventions to reduce the vulnerability of urban communities to the effects of climate change. In addition, the preferred solution would see the development of additional climate-resilient livelihoods from EbA – particularly for the urban poor – to enhance their capacity to adapt to the effects of climate change. These additional livelihoods would improve the socio-economic welfare of urban communities while restoring existing ecosystems and increasing green spaces in the city. As part of an integrated approach to delivering social, economic and ecological benefits, a solid waste recycling system would be developed. Such a system would reduce the amount of

⁹³ Examples of cities that have developed and implemented such plans already exist: Soltani, A, & Sharifi, E. 2012. A case study of sustainable urban planning principles in Curitiba (Brazil) and their applicability in Shiraz (Iran). *International journal of Development and Sustainability*. 1:120–134.

⁹⁴ Example of a city in the LAC region where this has been done: Hardoy, J. and Ruete, R. 2013. Incorporating climate change adaptation into planning for a liveable city in Rosario, Argentina. *Environment and Urbanization*. 25: 339-360.

⁹⁵ Jones, H.P., Hole, D.G. & Zavaleta, E.S. 2012. Harnessing nature to help people adapt to climate change. *Nature Climate Change* 2: 504–509.

⁹⁶ Household scale does not only include individual households, but is also extended to schools and public buildings.

waste in urban waterways thereby improving water flow and consequently reducing the frequency and severity of flooding.

Increased awareness of the general public of the benefits of urban EbA approaches

57. The preferred solution is to enhance public awareness – particularly of local government and urban communities – in the LAC region of the benefits of EbA as a low-risk and cost-effective approach to adapt to the effects of climate change. This would be achieved through several awareness-raising activities including local media campaigns and the development of educational toolkits at schools. As a result, local government and urban communities will have increased awareness of the benefits of urban EbA.

Adequate financial resources to implement urban EbA activities as part of municipal planning and budgets

58. The preferred solution is to have adequate financial resources to sustain, replicate and upscale the proposed EbA interventions across the three pilot countries and the LAC region in general. This will be achieved by actively engaging with representatives of the private sector in training workshops on urban EbA as well as the development and implementation of upscaling strategies including sustainable financing mechanisms. As a result of the implemented financing mechanisms, adequate financial resources will be catalysed for sustaining, replicating and upscaling of successful EbA interventions across the three pilot countries and elsewhere the LAC region.

Barriers to implementation of preferred response and contributions by the project to address these barriers

Limited technical capacity to integrate urban EbA into urban development planning

59. The majority of medium-sized cities in the LAC region have an urban development plan that guides the local government in effective and efficient city management. Moreover, the local governments of San Salvador, Kingston and Xalapa have to some extent included the concept of adaptation to climate change in their development plans⁹⁷. However, policy- and decision-makers of these cities currently do not have adequate technical capacity to develop and implement interventions – particularly urban EbA interventions – to adapt to climate change. This limited technical capacity is exacerbated by the limited availability of technical guidelines on implementing EbA interventions in urban settings. The local governments in San Salvador, Kingston and Xalapa are also unable to share information with and provide opportunities to urban communities for implementation of interventions for climate change adaptation, including EbA. Therefore, the technical capacity of local authorities and urban communities to plan and implement urban EbA remains limited.

60. The SCCF-financed project will overcome this barrier by **enhancing the technical capacity of local government to adapt to climate change**. The project will address this barrier under Outcome 1. Training will be provided to local government and the private sector on: i) developing strategies and policy briefs to integrate EbA into existing national and sub-national policies and strategies; and ii) implementing urban EbA to adapt to the effects of climate change. Through this training, local government will be able to develop technical

⁹⁷ These urban development plans include for example: Plan Municipal de Desarrollo 2014–2017 de Xalapa.

guidelines on urban EbA and disseminate these to the private sector and urban communities. These guidelines will be used to plan, implement and monitor urban EbA at the watershed, urban landscape and household scales. As a result, the institutional and technical capacity of both local government and urban communities in the three pilot cities to implement urban EbA will be enhanced.

Limited coordination with other sectors⁹⁸

61. Urban development is multi-sectoral in scope and therefore requires a multi-sectoral approach. However, there is overall limited coordination between relevant government departments⁹⁹, the private sector and research institutions – such as universities – in the LAC region. As a result, there have been few opportunities to: i) integrate recent research on climate change adaptation into the design and development of urban infrastructure; ii) address the complexity of climate change in an urban setting; and iii) share knowledge and lessons learned on climate change and adaptation.

62. The SCCF-financed project will overcome this barrier by **promoting cross-institutional coordination** under Outcome 1 and 3, respectively. Under Outcome 1, the coordination between national and sub-national authorities in relevant sectors – such as environment, water and urban planning – will be improved through workshops and training. For the three pilot cities, this training will be provided to *inter alia* MARN, MWLECC, SEMARNAT, Government of the State of Veracruz, Xalapa’s Municipality and CMAS¹⁰⁰. In addition, under Outcome 3, a communication strategy will be developed that will facilitate coordination between cross-sectoral committees on climate change in El Salvador, Jamaica and Mexico. In particular, this communication strategy will provide an opportunity to share resources and lessons learned with relevant stakeholders in the different sectors (see Section 3.3). Coordination between government, the private sector and research institutions will be further enhanced through building on existing frameworks to share technical information on climate change and urban EbA, including lessons learned from the interventions implemented through this project.

Limited on-the-ground demonstrations of the benefits of urban EbA

63. To date, there are few examples of urban EbA being implemented in the LAC region¹⁰¹ and the benefits of such interventions have not been well demonstrated. As a result, there is small evidence-base on the benefits of EbA in urban areas to guide policy- and decision-makers as well as urban communities in the LAC region. Without such evidence, policy makers are constrained in their ability to integrate EbA into existing and future urban development plans and policies. Consequently, EbA is not implemented at the urban landscape and urban watershed scales. Similarly, limited proof-of-concept makes urban communities reluctant to adopt EbA at the household scale.

⁹⁸ These sectors include Water, Environment and Forestry, Energy, Transport and urban planning.

⁹⁹ These government authorities include *inter alia* the Ministry of Environment, the Ministry of Water, the Ministry of Transport and the Ministry involved with Urban Planning.

¹⁰⁰ In Mexico, training will be provided to state and municipal level, which therefore includes SEMARNAT, the government of the State of Veracruz, Xalapa’s Municipality and CMAS.

¹⁰¹ The cities of: Curitiba (Brasil), Tulum (Mexico) and Rosario (Argentina) provide examples of urban EbA interventions.

64. Under Outcome 2, the SCCF-financed project will demonstrate the benefits of urban EbA at three scales in three pilot cities in the LAC region. Urban EbA interventions will be informed by the site-specific protocols developed under Output 2.3. In conjunction with the implementation of the urban EbA interventions, additional climate-resilient livelihoods will be promoted. The promotion of these livelihoods will demonstrate the co-benefits of urban EbA interventions, such as enhanced food security and increased household income. The long-term research programme developed under Outcome 3 will monitor the effects of the implemented urban EbA interventions and provide a scientific evidence-base for urban EbA. This research will be complemented by the feedback received from the target communities in the three pilot cities.

Limited awareness and research on urban EbA

65. National Governments in the LAC region increasingly recognise the importance of adapting to climate change. For example, in Mexico it is now mandatory for national and sub-national government departments to include the effects of climate change in their development plans. However, EbA in the urban context is a new concept for most government authorities in the LAC region. There is consequently limited knowledge within local governments on how EbA can increase the adaptive capacity of urban communities to the effects of climate change. Although universities and other research institutions in major cities in the region – including Kingston, San Salvador and Xalapa – have established programmes on climate change (see Section 2.6), there are few mechanisms for research institutions to inform national and local government authorities on recent research outcomes or developments on climate change adaptation and on urban EbA. This limited sharing of information has created a barrier for national and local governments to raise awareness on EbA in urban communities.

The SCCF-financed project will **enhance awareness on urban EbA** particularly regarding the cost-effectiveness and multiple benefits it provides¹⁰². Under Outcome 3, a communication strategy will be developed and implemented to raise awareness on urban EbA and the associated benefits. This strategy will include *inter alia* a public awareness raising campaign and the use of existing web-based information-sharing platform such as REGATTA. Under Output 3.1 of the SCCF-financed project a separate communication strategy for climate change will be developed for Mexico and El Salvador. Currently, Jamaica has developed a National Communication Strategy and Action Plan entitled “*Communication for Climate Resilience*”. The SCCF-financed project will therefore propose recommendations to integrate aspects of urban EbA in the implementation of this strategy.

66. To raise awareness on urban EbA and climate change among the youth at schools, educational toolkits will be developed as education increases the adaptive capacity of poor urban communities, particularly women¹⁰³. In addition, a long-term research programme will be established to monitor the effects of urban EbA interventions implemented through this and other projects. The findings of this research will be disseminated through a cross-sectoral framework –to be established by the SCCF-financed project – to further build the evidence base for urban EbA. Complementary to the long-term research programme, the target communities in San Salvador, Kingston and Xalapa will be involved to provide

¹⁰²UNEP/STREP 2012. A comparative analysis of ecosystem-based adaptation and engineering options for Lami Town, Fiji: Synthesis Report.

¹⁰³ Wamsler, C. et al. 2011. Climate change, adaptation and formal education: The role of Schooling for increasing Societies’ adaptive capacities. International institute for Applied Systems Analysis.

feedback on the effects of the implemented urban EbA interventions within their particular area.

Limited financial resources to implement urban EbA activities as part of municipal planning and budgets

67. Local authorities in San Salvador, Kingston and Xalapa currently have limited financial resources to undertake effective urban planning and incorporate urban EbA into medium- and long-term development planning.

68. The SCCF-financed project will overcome this barrier by **developing a sustainable financing strategy** under Outcome 1 to promote the replication and upscaling of urban EbA. To achieve this, the private sector will be involved from the inset of the project through meetings to explore options for financing the continuation and upscaling of the EbA interventions. Under Output 1.4, a sustainable financing strategy will be developed in collaboration with the private sector in San Salvador, Kingston and Xalapa.

Project activities

69. The SCCF-financed project will facilitate the coordination and knowledge sharing of urban EbA across the LAC region through collaboration with: i) organisations that are undertaking projects related to urban EbA and other forms of climate change adaptation; and ii) national and sub-national government authorities in El Salvador, Jamaica and Mexico. In addition, the project will provide training and demonstrate on-the-ground urban EbA interventions to increase the capacity of the urban population to adapt to the effects of climate change. These pilot interventions will be implemented in San Salvador, Kingston and Xalapa and will be monitored as part of a long-term research programme on climate change adaptation developed by the project. Results of this research will be used to: i) inform national and local policies and strategies to adapt to climate change using urban EbA; and ii) promote the replication and upscaling of urban EbA.

70. The SCCF-financed project will address the barriers above by implementing three components. These components and activities are further detailed in Section 3.3.

2.4. Institutional, sectoral and policy context

The institutional, sectoral and policy context for the SCCF-financed project is described below.

El Salvador

Institutional context

71. The MARN in El Salvador. This ministry has the mandate as the rector of the national environmental management and promotes a civic culture to restore the environment and reduce environmental risks. Its mission is to reverse environmental degradation and reduce risks through inclusive, accountable and transparent public environmental management. In addition to the MARN, there are two other ministries responsible for developing and implementing policies, strategies and plans that relate to environmental management. These include the Ministry of Agriculture and Livestock (MAG) and the Ministry of Government and Land Development (MGDT). MAG: The governing institution of Agricultural Policy, Forestry, Fisheries, Aquaculture and Rural, which contributes to the growth and development of the

different actors in the production chains of the expanded agricultural sector. Its mission is to facilitate and streamline the process of sustainable development in the areas of Agriculture, Forestry, Fisheries, Aquaculture and Rural through effective services to contribute to the welfare of the Salvadoran population, particularly rural families. The mandate of MGDТ is to be an inclusive, supportive, transparent, and efficient institution, with competent workers and committed to the service while strengthening democracy, social justice and economic growth for human development. Its mission is to ensure good governance and to provide services for the benefit of the population through preventive actions and participatory organisation, integrating institutional efforts to improve the quality of life.

Policy context

72. The Government of El Salvador (GoES) has introduced multiple policies, strategies and legislation relating to appropriate environmental management and sustainable development. The legislative frameworks, strategies and multilateral environmental agreements relevant to the SCCF-financed project, and with which the project will comply, are presented below.

Relevant policies

73. **National Environmental Policy** (2012): The objective is to reverse environmental degradation and reduce vulnerability to climate change through six priority lines of action. These include i) restore degraded ecosystems and landscapes; ii) progress towards a comprehensive environmental sanitation; iii) achieve a modern and effective institutional framework for managing water resources; iv) incorporating environmental considerations into land use planning; v) promote a culture of environmental responsibility and compliance; and vi) promote vigorous action to adapt to climate change and risk reduction. This policy guides the action of the public, central and local government in the implementation of plans and programs

Policy Action Living with Drought in El Salvador (2003). The main objective of the policy is to reduce the social, economic and environmental vulnerability to drought in El Salvador, through the implementation of eight strategic guidelines: i) consistency in the implementation of public policy; ii) interagency coordination; iii) strengthening with institutional partners; iv) decentralization and local development; v) promoting sustainable rural development; vi) strengthening the productive fabric; vii) appreciation of ecosystems; and viii) communication.

Draft National Policy on Water and Sanitation (2011). Its overall goal is to improve the coverage and quality of potable water and sanitation in El Salvador, through the modernisation of governmental institutions that governs, regulates and provides such services. The policy has 5 strategic axes: i) expanding the coverage and quality of the potable water and sanitation of the poorest people in the country; ii) modernisation of the regulatory framework and institutional services water and sanitation; iii) development and promotion of efficient delivery models of potable water and sanitation; iv) education and citizen participation in the management, conservation and recovery of water sources for human consumption; and v) strengthening and developing financing mechanisms for drinking water and sanitation.

Legislative Framework

74. **The Environmental Law** (1998). Article 6 provides for the establishment of the SINAMA – coordinated by the MARN – under the other environmental units of the AMSS municipalities. These environmental units establish, operate and maintain institutions and public sector institutions principles, standards, programming, direction and coordination of environmental management of the State. In addition, article 52 provides that "the Ministry will promote – in coordination with the Ministry of Health and Welfare – regulations and programs to the municipal governments, the private sector and NGO's to reduce, recycle, reuse and properly dispose solid waste. To achieve this, a national program for integral management of solid waste will be developed, which will incorporate the criteria for selecting sites for disposal.

75. **Forestry Law** (2002). This law provides general guidelines for reforestation in El Salvador and sustainable management of the forest.

76. **General Regulation of the Forestry Law** (2004). The regulation aims to develop the provisions of the Forestry Law. Among the topics covered in the regulation, through the different chapters of the regulation they are: education and capacity forest, management of natural forests in private ownership, forest management plans, etc.

77. **General Water Law** (2012). The draft is not yet approved, but includes the issue of Climate Change. This law aims to regulate the management of the continental, insular, estuarine and marine waters within the national territory, regardless of their location, physical condition, quality or natural condition, to ensure its sustainability and the right to water for life of all the country's inhabitants.

78. **Law on Civil Protection, Prevention and Disaster Mitigation** (2005). This law aims to prevent, mitigate and effectively address natural and human-induced disasters in the country and provide the public service of civil protection. In addition, the law outlines regulations to guarantee the life and physical integrity of persons and the security of private and public goods.

79. **The Special Regulations for the integrated management of solid waste** (2000) is therefore created to regulate the management of solid waste. The scope of it includes solid waste from household, commercial or institutional services. The law states that the MARN will enforce these regulations. The penalty of violating these regulations will be through fines and based on minimum monthly wages.

80. **Law on territorial planning and development** (2011) provides a framework to regulate land use planning and institutions to develop territorial management of public and private activity and meet standards on land use and resource management.

National strategies, plans and programmes

81. **The National Climate Change Plan** (PNCC) has been published in June 2015. The PNCC is the framework to coordinate i) public administration and intersectoral policy assessments; and ii) the impacts and vulnerability of different sectors and systems to adapt to Climate Change. The main objective is to integrate climate change adaptation into the planning and management of national socio-economic sectors and ecological systems. This plan will be updated every five years.

82. **National Biodiversity Strategic Action Plan (2014):** The National Biodiversity Strategic Action Plan (2014) focuses on large-scale restoration and conservation, including the country's ecosystems, with the aim to recover the capacity required to sustain current and future development. The strategy is structured along three main goals and identifies respective priority areas: i) biodiversity mainstreaming in the economy (agriculture, fisheries and aquaculture, tourism); ii) restoration and conservation, including critical ecosystems (including rivers and wetlands, and forest ecosystems); and iii) biodiversity for the people (including local economic options). The action plan is currently in development.

83. The SCCF-financed project is consistent with **El Salvador's National Five-year Development Plan (2014–2019)**. Within this plan, objective 7 describes the action plans to transfer El Salvador towards an economy and society that is sustainable and resilient to the effects of climate change. This will include the restoration and conservation of degraded ecosystems and reducing the vulnerability to the effects of climate change. The plan emphasises that an adequate response to climate change requires the integration of climate change within the sectors of energy, water and economy. The plan mentions that the disorganised expansion of urban areas contributes to the vulnerability of urban communities to the effects of climate change.

84. **The National Programme on the Restoration of Ecosystems and Landscapes (PREP) (2012–2016)** involves four ministries: the MARN, the Ministry of Planning (MOP), the MAG and the Ministry of Finance (MAF). Under this programme, the following was accomplished: i) approval of the national Environmental policy in 2012; ii) establishment of the inter-institutional committee of climate change and the inter-institutional committee to finance climate; iii) incorporation in the Environmental Law of a climate change chapter; and iv) the incorporation of a focus on climate change in main sectors and the political budget.

85. **The Environmental Strategy for Adaptation and Mitigation to Climate Change in Agriculture, Forestry and Aquaculture Sector (2012)** is executed by the MAG and will be financed with funds from the budget allocation of this ministry¹⁰⁴. The strategy aims to contribute to the adaptation of the impacts of climate change on agriculture, forestry, fisheries and aquaculture, with a focus on sustainable watershed management. To achieve this goal the strategy outlines six areas with sixty four specific actions that align with the action areas identified in the Family Agriculture Plan. These six areas are: i) capacity building; ii) innovation and technology transfer; iii) inter-institutional cooperation; iv) institutional strengthening; v) communication; and vi) citizen participation. The strategy highlights the importance of the agricultural sector for food production, job creation and foreign exchange received through exports of agricultural products. In addition, the strategy promotes inter-institutional collaboration with the MARN and the design of good agricultural practices with the PREP through a communication campaign that is aimed at agricultural producers using radio and television spots.

86. **The National Climate Change Strategy (2013)** provides specific guidance for the definition of specific sectoral strategies and plans that will be part of the first National Climate Change Plan, with participation of Salvadoran society. The strategy is structured around three main areas: i) mechanisms to address recurring losses and damages, ii) climate

¹⁰⁴ Ministerio de Agricultura y Ganadería (MAG), 2012, Estrategia Ambiental de Adaptación y Mitigación al Cambio Climático del Sector Agropecuario, Forestal y Acuícola (<http://www.mag.gob.sv/phocadownload/Planes/estrategia%20ambiental%202012.pdf>)

change adaptation and iii) climate change mitigation, which provides co-benefits. Each area focuses on five elements: awareness, education and training, research, technology and funding¹⁰⁵. The institutional requirements identified to implement this strategy are: i) inter-institutional coordination; ii) institutional strengthening; iii) local governance and management models; and iv) monitoring and evaluation.

87. **National Action Programme to Combat Desertification and Drought (2003)**. This programme is a national instrument, whose main objective is to combat land degradation and mitigating the impact of drought. Its action strategy is based on five components: 1) conservation of natural resources; ii) productive activity; iii) education, training and communication; iv) Early Warning System; and v) legal and institutional frameworks. These will contribute to the recovery of degraded land, the implementation of preventive measures even or slightly degraded, restoration, rehabilitation, conservation and management of natural resources in order to contribute to security food and reduce poverty and promote sustainable development of the population.

88. **The National Strategic Plan for Food Security and Nutrition (2013–2016)** is executed by The National Council for Food Security and Nutrition and integrated by the Minister of Health, the Secretary of Social Inclusion, the Technical Secretary of the Presidency and the MAG, to achieving the first Millennium Development Goal. The Strategic Plan addresses the food and nutrition problems using a multisectoral approach. The plan has eight strategic pillars, to improve the following conditions: i) food availability; ii) physical and economic access to food; iii) adequate food intake; iv) body health for reproduction; v) the food and nutritional care for those affected or at risk groups; vi) food and nutrition response to people affected by emergencies; vii) surveillance, early warning, monitoring and evaluation of food Security and Nutrition (SAN) for the decision and the reorientation of action; and viii) institutional strengthening for the SAN.

Jamaica

Institutional context

89. **The Ministry of Water Land, Environment and Climate Change (MWLECC)** in Jamaica has the responsibility for ensuring that Jamaica has a healthy and natural environment. The portfolio areas of the Ministry include inter alia: Climate Change, Environmental Management, Land Administration and Management, Land Titling, Meteorology, Town and Country Planning and Water and Wastewater Management. The Ministry is primarily responsible for policy formulation, facilitation of project and programme implementation and monitoring of its portfolio agencies. The ministry discharges its mandate through the following bodies: The Climate Change Division was created in January 2012. A National Communication Strategy and Action Plan entitled “Communication for Climate Resilience (2012-2017)” has been prepared for the Pilot Programme for Climate Resilience (PPCR).

90. **The National Environment and Planning Agency (NEPA)** was established in April 2001 as an Executive Agency under the Executive Agencies Act. NEPA was founded to undertake the technical (functional) and administrative mandate of three statutory bodies including: i) The Natural Resources and Conservation Authority (NRCA); ii) The Town and

¹⁰⁵ MARN. 2013. Segunda Comunicación Nacional sobre Cambio Climático.

Country Planning Authority (TCPA); and iii) The Land Development and Utilisation Commission (LDUC)¹⁰⁶.

Policy context

91. The Government of Jamaica (GoJ) has introduced multiple policies, strategies and legislation relating to appropriate environmental management and sustainable development. The legislative frameworks, strategies and multilateral environmental agreements relevant to the SCCF-financed project, and with which the project will comply, are presented below.

Relevant policies

92. **The Climate Change Policy Framework** is funded by the European Union and UNEP to prepare the policy. The main objective of the programme is to support the goals of Vision 2030 Jamaica – National Development Plan by reducing the risks posed by climate change to all of Jamaica's sectors and development goals. It outlines the strategies to respond effectively to the impacts and challenges of climate change, through measures, which are appropriate for varying scales and magnitudes of climate change impacts.

Legislative Framework

93. **The Forestry Act** (1996) and **Forest Regulations** (2001). The Forestry act is currently under revision to be updated. The Forest Act and Regulations are both administered by the Forestry Department. The Act and Regulations designate specific personnel who are given the responsibility of and the required power to ensure sustainable management of the forests in Jamaica and prevention of illegal activities.

94. **The Land Development and Utilisation Act** (1966). This act is administered by the NEPA and provides a framework to inspect the condition and use of land.

95. **The National Solid Waste Management Act** (2001). This act is administered by the National Solid Waste Management Authority. The act provides a framework to enter and inspect the disposal of waste and the removal of litter.

96. **The National Resource Conservation Authority Act** (1991). This act is administered by the NEPA and provides guidelines to ensure the correct execution of EIA's and overall management of natural resources. In addition, the Authority may serve an enforcement notice where an activity poses a serious threat to natural resources or to public health.

97. **The National Building Code** has been developed to establish new guidelines for the construction of hurricane resistant buildings across the island. This includes the use of hurricane straps and water tanks. The code outlines the building standards for construction within the coastal zone, which will take into consideration physical planning standards, such as coastal setbacks.

Relevant strategies, plans and programmes

¹⁰⁶ <http://www.nepa.gov.jm/new/about/overview.php>. Accessed on 18 March 2015.

98. **Vision 2030 Jamaica** – National Development Plan provides a comprehensive planning framework in which the economic, social, environmental and governance aspects of national development are integrated. As one of the executing ministries of this vision, the MLWECC is responsible to develop and enforce national environmental policies and developing strategies.

99. A **National Communication Strategy and Action Plan entitled “Communication for Climate Resilience (2012-2017)”** has been prepared for the Pilot Programme for Climate Resilience (PPCR). This five-year action plan has been developed based on a thorough needs assessment and situational review of the current climate change effects that are affecting main economic sectors. This will be addressed under the PPCR as well as through extensive consultation with stakeholders. To avoid duplication and to maximize the use of available resources, the action plan builds as much as possible on existing climate change communication experiences and seeks to engage with a wide range of stakeholders already involved in communicating climate resilience. The action plan addresses the gaps in “Knowledge, Attitudes and Practices” (KAPs) for each specific sector¹⁰⁷. The study is undertaken and outlined in Jamaica’s Second National Communications and the State of the Jamaican Climate reports.

100. The **Jamaica National Environmental Action Plan (JaNEAP)**. JaNEAP is the government’s strategic action plan for environmental and physical planning. In particular, JaNEAP is designed to address all broad thematic questions highlighted in a number of multilateral agreements. These agreements include: i) the **Mauritius Strategy of Implementation (MSI)**; ii) the **Johannesburg Plan of Implementation (JPI)**; and iii) the **Millennium Development Goals (MDGs)**. In addition, these agreements provide the government an overarching framework for tracking the government objectives on environment and sustainable development.

101. The **Water Sector Adaptation Strategy to Address Climate Change (2008)**. The strategy provides an assessment of the water sector vulnerability to climate change and outlines the duties of the government and other stakeholder groups in helping to build the resilience of the sector against climate change and other potential hazardous impacts.

102. **The Strategic Forest Management Plan (2010-2014)** sets out the targets for reforestation and afforestation programmes that remove carbon dioxide from the atmosphere.

103. **The National Biodiversity Strategy and Action Plan (NBSAP) (2003)**. In this plan, climate change effects on biodiversity are not a major focus. However, Jamaica is currently updating its NBSAP with GEF funding and will probably be released early 2016. The updated plan will – among other things – produce measurable targets to safeguard or restore key ecosystem services, particularly for water, health and livelihoods¹⁰⁸.

Mexico

¹⁰⁷ These sectors include: water, health, agriculture and fisheries, tourism, human settlements and built environments, energy and financial and insurance.

¹⁰⁸ <http://jis.gov.jm/jamaica-revising-national-biodiversity-strategy-action-plan/>. Accessed on 26 March 2015.

Institutional context

104. **The Ministry of Environment and Natural Resources (SEMARNAT)** in Mexico has the mandate to lead climate change policy through the general Direction of policies for Climate Change. As part of the SINACC, the INECC – as scientific and technical branch of the ministry – advises SEMARNAT on technical and scientific questions related to climate change and carries out the official evaluation of climate efforts at national and state level¹⁰⁹.

Policy context

105. The Government of Mexico (GoM) has introduced multiple policies, strategies and legislation relating to appropriate environmental management and sustainable development. The legislative frameworks, strategies and multilateral environmental agreements relevant to the SCCF-financed project, and with which the project will comply, are presented below.

Legislative Framework

106. Mexico's **General Law on Climate Change (LGCC)** (2012) provides the legal framework to regulate and systematize national policies and actions with a crosscutting, participative and long-term perspective. Under this law, municipalities are required to “formulate and apply policies to address climate change in agreement with the National Development Plan, the National Climate Change Strategy and the Special Climate Change Programme (2014–2018) at state and local levels”. This law places particular emphasis on, *inter alia*: i) water and sanitation service provision; ii) land use planning; and iii) natural resource conservation. Many municipalities are currently elaborating their respective Municipal Climate Action Plans. The SCCF-financed project will contribute by mainstreaming urban EbA into these plans.

107. **Veracruz State Law for Adaptation and Mitigation to the effects of Climate Change** (2010). The law's objective is to formulate and implement public policies for: i) climate change adaptation; ii) climate change mitigation; iii) protection of the state's inhabitants; and iv) contribution to sustainable development within the Veracruz State. In addition, this law proposes “the incorporation of forest within PES systems and a policy criteria of zero deforestation rate” and aims to strengthen programmes to prevent deforestation and degradation of natural ecosystems.

108. **The General Law for Human Settlements (LGAH)** (1993). This law is designed as a coordinating document to create coherence between the federal government, states and municipalities in the management and regulation of human settlement. This is done by providing norms for planning the establishment, maintenance, improvement and growth of urban areas. In addition, the law articulates the hierarchy of development plans to guide the planning and regulation. Municipalities have the authority to approve urban development programmes and grant building permits. These plans are formulated and approved by the city council, who also administers the zoning of urban areas.

109. **The National Water Law** (1992, reformed in 2013). This law states that the main functions in the water sector are the responsibility of the federal government, through the National Water Commission (Conagua). It established operational entities for water

¹⁰⁹ SEMARNAT would be a collaborative entity, while the Municipality of Xalapa would be the executing entity.

management: Watershed Councils and Watershed Agencies. The Watershed Councils are the institutional framework for the participation of representatives of the federal, state and municipal governments, water users and NGOs.

110. **The General Law for Civil Protection** (2012) defines responsibilities among levels of government and institutions to promote a coordinated and organised response to disasters.

111. **The National System for Climate Change** (SINACC). Led by the President, the SINACC comprises the Inter-ministerial Commission on Climate Change (IMCC), the Climate Change Council (C3); the National Institute for Ecology and Climate Change (INECC), the governments of the States, representatives of the national associations of municipal authorities, and the National Congress. This system operates as a permanent mechanism to foster cooperation, communication and coordination to bring about the national climate change policy.

112. **General Law on Sustainable Forest Development** (2003). The objective of this law is the development of forest goods and services while safeguarding the rights of indigenous people to the natural resources in their land. Specifically, article 51 of this law relates to the National Forest Registry within SEMARNAT to record all transactions relating to forest land ownership, land use rights and authorized forest management programs. In addition, the law provides legal definitions of concepts such as “deforestation¹¹⁰” and “degradation”, which is defined as a decrease in a forest ecosystem’s ability to provide environmental services or a decrease in its production capacity.

Relevant strategies, plans and programmes

113. **Climate Change Programmes at state level.** The climate change programmes of the States will establish the strategies, policies, guidelines, objectives, actions, goals, and indicators to be implemented, in accordance with the National Strategy, the Special Programme, the General Law on Climate Change, as well as all other provisions deriving thereof. The State programmes will always endeavour to maintain gender equity and representation from the most vulnerable populations to climate change, including indigenous people and those with disabilities. The programmes will also involve the participation of academics and researchers. The State programmes will include, among others, the following elements: i) Long-term planning of its objectives and actions, in a manner consistent with the National Strategy and Programme; ii) Climate change scenarios and diagnosis of vulnerability and adaptation capacity; iii) The goals and actions for mitigation and adaption related to their own jurisdiction, pursuant to this Law and all other provisions deriving thereof; iv) The measurement, reporting on, and verification of the adaptation and mitigation measures; and v) Any other element established by the legal framework on the subject matter.

114. The SCCF-financed project is consistent with **Mexico’s National Climate Change Strategy (ENCC), Vision 10-20-30** (2013). In particular, it is aligned with strategic objectives A1, A2 and A3, which aim to “reduce vulnerability and increase resilience of the social sector towards climate change effects”, and “conserve and manage ecosystems sustainably to maintain the environmental services they provide”, respectively. The strategy guides the mid- and long-term national policies required to manage climate change challenges and the

¹¹⁰ Deforestation is referred to here as a complete loss of forest vegetation due to natural or induced causes.

transition towards a more sustainable, competitive and low carbon economy. In addition, it provides a strategic action plan, based on available information on current and future climate conditions, to guide policy-making processes at all scales of government and promote co-responsibility with other sectors.

115. The **Special Programme on Climate Change (PECC)** (2014–2018). Mandated by the LGCC, the PECC is the short-term planning instrument aligned with the National Development Plan and the ENCC. Its life cycle is limited to the duration of each Federal Administration. The PECC includes a long-term perspective in terms of international commitments and the dynamic social, economic and environmental conditions of the country. In addition, mitigation and adaptation targets are linked to crosscutting actions needed to achieve them. The Federal Public Administration negotiates with the Congress (Chamber of Deputies) the availability of resources within the federal budget to carry out these actions and assigning responsibilities across the ministries that are involved in them. Finally, the PECC considers current scientific data available, and is subject to periodic evaluation and adjustment.

116. **The Veracruz Programme on Climate Change (PVCC)** (2009). The programme identifies forestry sector mitigation actions and aims to increase carbon storage in wood products through: i) afforestation/reforestation; ii) regeneration and agroforestry; and iii) reduction of deforestation. Particularly for the forestry sector, the PVCC mentions that one of the types of vegetation most sensitive to climate change in Mexico is the cloud forest. Climate change will affect ~45–60% of its distribution. In Veracruz, the cloud forest covers an area of ~270 million hectares and the implementation area of the project is characteristic of this type of vegetation.

117. The **Intended National Determined Contribution (INDC)** (2015). On March 25, 2015, Mexico submitted its INDC. The INDC of Mexico¹¹¹ has two components, one for adaptation and one for mitigation and translates previous commitments into mandatory goals. The priority areas for adaptation are the protection of communities from adverse impacts of climate change as well as increase the resilience of infrastructure and ecosystems. The adaptation component takes into account gender equality and human rights approach. In addition, the component is addressed in three main areas: i) adaptation to climate change for the social sector; ii) Ecosystem-Based Adaptation; and iii) adaptation of strategic infrastructure and productive systems. Each one of these areas has specific actions to be taken for reducing the vulnerability of the country, and is expected to be undertaken from 2020 to 2030.

118. **The National Water Plan 2014-2018 (PNH-Plan Nacional Hídrico)**. This plan is formulated by CONAGUA to implement national and regional programmes within the scope of the current administration to address the major water challenges, which are increased by climate change. The overall objectives of the plan are to achieve water security and water sustainability in the country. Specific objectives include: i) strengthening sustainable water management; ii) increasing water security to face droughts and floods; iii) improving water supply, access to potable water and disposal of wastewater; iv) increasing the scientific, and technological capabilities of the sector; v) securing water for irrigation, energy, industrial, tourism, and other economic and financial activities in a sustainable manner; and vi)

¹¹¹ Government of Mexico. 2015. Intended Nationally Determined Contribution.

consolidating Mexico's participation in international policies and actions regarding water management.

119. **National Biodiversity Strategy Action Plan (NBSAP) (2000)**. The plan has established four strategic lines to accomplish the biodiversity objectives: i) conserve and protect the biodiversity components iii) value the different components of biodiversity; ii) promote knowledge on biodiversity and iv) encourage sustainable and diversified use of biodiversity components. In 2002, State-Level Biodiversity Strategies (SBS) were being developed in conjunction with state governments and representatives from different social sectors. The main goal of these SBS is to provide planning instruments to local governments and decision-makers with a comprehensive framework to conserve and sustainably use biological diversity, according to specific contexts and characteristics.

Relevant regional/global agreements

The SCCF-financed project is aligned with the global, regional and national programmes and agreements described below.

120. The **Sustainable Development Goals (SDGs)** are a proposed set of targets to replace the Millennium Development Goals, which expire in 2015. However, the SDGs take a broader approach on environmental sustainability. As a result, there are 17 SDGs to be achieved by 2030. The goals relevant to the SCCF-financed project are to: v) achieve gender equality, by ensuring equal participation of men and women in project activities; vi) ensure water availability by installing rainwater harvesting systems at household scale; ix) build resilient infrastructure by creating permeable pavements; xi) make cities and human settlements inclusive, resilient and sustainable through the integration of three scales for implementation of EbA interventions; xiii) take action to combat climate change and its impacts by taking into account current and future climate change scenarios; xv) protect, restore and promote sustainable use of terrestrial ecosystems through the restoration and rehabilitation of watersheds and wetlands.

121. El Salvador, Jamaica and Mexico are Parties to the following multilateral agreements:

- **UN Framework Convention on Climate Change (UNFCCC)**
- **Kyoto Protocol**
- **United Nations Convention to Combat Desertification**
- **Convention on Biological Diversity; and the Ramsar Convention on Wetlands.** The SCCF project will restore urban and peri-urban ecosystems – among which wetlands – to increase the water availability for urban communities and reduce flooding in the city. This restoration will also include reforestation of degraded ecosystems.

Mexico and El Salvador are also signatory to the:

- Since 1994 Mexico is a full member of OECD and participates in all its climate related activities and programmes.
- **Declaration of San Pedro Sula (2008)**. This declaration led to the regional work to implement and coordinate shared vulnerabilities to climate change.

122. At regional level there is the Latin America and the Caribbean Regional Programme of Action known as "**Integrated Management of Water and Coastal Resources**" (**IMWCR**). The SCCF-financed project is aligned with the IMWCR programme by restoring urban

catchments and building technical capacity of local government to plan urban EbA for watershed restoration.

123. The **Campeche Declaration on the Mesoamerican Strategy for Environmental Sustainability** (2008). This strategy provides a framework to promote cooperation in the Mexico and Central America in the strategic areas of biodiversity, forests and climate change. The SCCF-financed project is aligned with this declaration by using this framework to integrate biodiversity and climate change.

124. The Caribbean Community (CARICOM) **Regional Framework for Achieving Development Resilient to Climate Change (2009–2021)**. This document outlines the regions strategic approach to increase resilience to climate change. The Regional Framework is guided by five strategic elements to increase the resilience of the CARICOM member states' social, economic and environmental systems. The five elements are i) mainstreaming adaptation to climate change into the sustainable agendas of the CARICOM states; ii) promote the implementation of specific adaptation measures; iii) promote the reduction of GHG emissions; iv) encourage the reduction of vulnerability of natural and human systems to climate change; and v) promote social, economic and environmental benefits through forest management in CARICOM countries.

National and local level

125. The SCCF-financed project will align with the national and local policies and strategies on climate change and urban development planning in each country (See section 3.6). The international conventions described above, provide frameworks that influence the policies of signatory nations. Examples include i) the National Communications under the UNFCCC; ii) the NBSAP under the Convention on Biological Diversity (CBD); and iii) the National Capacity Self-Assessment for Global Environmental Management (NCSA) under the United Nation Convention to Combat Desertification (UNCCD). These documents provide guidance for the countries to manage the effects of climate change. However, there is a stronger focus on mitigation than on adaptation. Therefore, more emphasis should be placed on adaptation to climate change, particularly through EbA.

126. The SCCF-financed project will also align with the Technology Needs Assessments (TNAs) that El Salvador and Jamaica have undertaken. These TNAs are a set of country-driven activities that identify and determine the mitigation and adaptation technology priorities of developing country parties. Since Mexico is only classified as a Non Annex 1 developing country, the country has not developed a TNA. The SCCF-financed project will build on the technology needs analyses and training material developed for the global TNA project. This includes further development of the TNA and updating the Technology Action Plan (TAP). In addition, the SCCF-financed project will collaborate with the TNA programme to share lessons learned on transferring adaptation technologies to other developing countries.

127. In Xalapa, Mexico there are specific local policies and plans that are related to climate change and urban planning. These include: i) the Municipal Climate Programmes, which is currently under review; and ii) the development plan for the city of Xalapa for the period 2014–2017.

128. The SCCF-financed project will therefore contribute to these frameworks and policies by i) introducing EbA; and ii) strengthening the local, national and regional capacities to mainstream EbA into urban, local and national policies.

2.5. Stakeholder mapping and analysis

129. The development process for SCCF-financed project was country driven and included extensive consultations with local urban communities, civil society organisations, city management authorities and relevant government authorities in the sectors of urban planning, transport, energy, water and the environment. At the commencement of the PPG phase in February 2015, a regional workshop was held with the national consultants and national focal points of El Salvador, Jamaica and Mexico to outline the background and the development process for the SCCF-financed project. This regional workshop was followed by stakeholder consultations including: i) national inception workshops during March–April 2015 (see Appendix 22); ii) national validation workshops during July 2015 (see Appendix 22); iii) multiple individual meetings with national stakeholders between February and July 2015; and iv) a series of face-to-face meetings with SEMARNAT and INECC on the project development in Mexico.

130. The purpose of the workshops was to: i) validate the selection criteria for the pilot city in each country; ii) validate a list of specific criteria¹¹² for the intervention sites within the pilot cities during the inception phase of the proposed project; iii) validate baseline projects in each pilot city that the SCCF-financed project will build on; and iv) identify the most appropriate urban adaptation interventions, based on initiatives elsewhere in the region and vulnerability of local communities in the pilot cities. Additionally, various concepts were clarified to the stakeholders during the workshop, including the principles of GEF SCCF projects, the development process for these projects and the (urban) EbA approach.

131. Between February 2015 and July 2015, workshops were complemented by regular consultations with the three national consultants from El Salvador, Jamaica and Mexico respectively. The objectives of these consultations were to: i) identify the most vulnerable areas in the pilot cities; ii) identify appropriate baseline projects within these areas; iii) develop a detailed list of urban EbA interventions to implement in the selected sites; iv) calculate the costs of each intervention; and v) set up realistic indicators and targets for these interventions. To achieve this, the three national consultants engaged with national, provincial and local stakeholders, visited the pilot cities and selected the intervention sites using a set of selection criteria (see Appendix 15). As a result, the EbA interventions of the proposed project are aligned with the cities' specific priorities and needs to adapt to climate change. This participatory approach will also be followed during the project implementation phase and will promote ownership of the project by the government and local communities. The stakeholders consulted during the PPG phase are outlined in Table 6 below. Municipal associations will be engaged with during the inception phase of the project to coordinate the delivery of project interventions. This will play a critical role in ensuring the sustainability of project interventions as well as promote upscaling and replication.

El Salvador

132. In collaboration with the MARN and the Environment Unit of the Legislative Assembly, the national consultant mapped the different stakeholders for the project. Based on this stakeholder mapping, bilateral meetings were held to explain the project, obtain relevant information and propose interventions. Bilateral meetings were held with various ministries, including: the Department of Climate Change Adaptation and Strategic Management of Risk

¹¹² These criteria are based on the GEF SCCF criteria for the selection of the intervention sites

(DACGER) under the Ministry of Public Works (MOP) and the Vice-Ministry of Housing, which is executing the baseline project. Within the MARN, representatives from the following different departments were consulted: the environmental observatory, the environmental management system, and the ecosystems and ministerial department office. A bilateral meeting was also held with the National Administration of Water and Sewage (ANDA) to discuss the problem of flooding and waste management. At a local level, meetings were held with the Planning Office of the Metropolitan Area of San Salvador (OPAMSS) and the mayor of San Salvador. Lastly, meetings were held with representatives from local and international NGOs that are working on disaster management, climate change and/or water management, such as Oxfam, Geólogos del Mundo, UNES, CORDAID and ACUA.

133. Using this comprehensive stakeholder list, the national workshop in El Salvador was held on March 24th, 2015. The 38 participants were from various government institutions. These included: the MARN, the MOP, the Ministry of Education, MINED, the Legislative Assembly, the ANDA, the OPAMSS, universities, local and international NGO's, the private sector and international organisations such as UNDP. Please see Appendix 21 for the workshop report and attendance list. The workshop results included the validation of the implementation area and the selection of EbA interventions for the project by the participants.

134. On 3 June 2015, a meeting was held with the most vulnerable communities of the Arenal-Monserrat area. The meeting was held at the Mayor Office, district 4, in which representatives of the mayor and the neighbourhood La Malaga, La Vega and Santa Anita participated. The objectives of the meeting were: i) knowing the scope of the project; ii) validating the participation of the communities mentioned in the project; and iii) proposing and validating interventions at the three scales. The community provided their input to the project and the proposed interventions. In particular, they showed interest and provided feedback to: i) the solid waste management plan; ii) the construction of urban gardens; iii) creating water harvesting and ecological sanitation at schools; and iv) the cleaning campaigns. Moreover, they proposed to create of a group of environmental guards to monitor the cleaning in the community.

Jamaica

135. In collaboration with the MWLECC, a stakeholder list was compiled for the National Workshop. Priority was given to those who could: i) contribute to the discussion; and ii) provide useful and accurate data for city selection and the area in the city most appropriate for implementing the EbA actions. The National workshop was held on 3 March 2015 and attended by 70 people.

136. Participants included representatives of: i) the Government of Jamaica, including MWLECC; ii) local and international NGO's; iii) civil society groups; iv) partner government institutions and academia; and v) the private sector. In addition, consultations with members of the target communities around the KMA and representatives from the Kingston, Saint Andrew and other Parish Councils were held to build consensus for future replication of actions after the initial pilot phase of the SSCF-financed project. Please see Appendix 21 for the workshop report and attendance list.

Mexico

137. The national workshop was held on 21 April 2015. The selection of stakeholders stemmed from preliminary lists drawn by the Municipality of Xalapa and by the Directorate General for Climate Change in SEMARNAT. For the national workshop, the selection

focused on local experts. Those selected stakeholders who were unable to participate in the workshop were contacted in a further visit by the National Consultant, in June.

Table 6. The main stakeholders consulted in each country.

Stakeholders	El Salvador	Jamaica	Mexico
National government	<p>MARN</p> <ul style="list-style-type: none"> • MOP • Ministry of Education (MINED); • Department of Climate Change Adaptation and Strategic Management of Risk (DACGER); • Legislative Assembly; • National Administration of Water and Sewage (ANDA); and • Ministry of Agriculture and Livestock (MAG). 	<p>MWLECC</p> <ul style="list-style-type: none"> • National Environment and Planning Agency (NEPA); • Ministry of Forestry and Fisheries; • Forestry Department; • Ministry of Finance and Planning; • Planning Institute of Jamaica; • Ministry of Education; • Ministry of Health; • Ministry of Local Government and Community Development; • Ministry of Science Technology Energy and Mining; • Ministry of Transport Works and Housing; • Ministry of Industry Investment and Commerce; • National Solid Waste Management Authority; • National Water Commission; • Water Resources Authority; • Office of Disaster Preparedness Emergency Management; and • Meteorological Services. 	<p>SEMARNAT</p> <ul style="list-style-type: none"> • National Water Commission CONAGUA; • National Institute of Ecology and Climate Change (INECC); • National Forest Commission (CONAFOR); • National Commission for Protected Areas (CONANP); • Veracruz state Secretariat for the Environment (SEDEMA); • Ministry of Agricultural, Land and Urban Development (SEDATU); and • National Centre for Disaster Prevention (CENAPRED).
Local	<ul style="list-style-type: none"> • Community representatives of Arenal-Monserrat; • Mayor of San Salvador; and • The Planning Office of the Metropolitan Area of San Salvador (OPAMSS). 	<ul style="list-style-type: none"> • Mayor of Kingston; • Community of Rae Town; • Portmore Municipal Council; • Mayor of Saint Andrew; • Mayor of Mandeville; • Mayor of Montego Bay; and • Negril Planning Authority. 	<ul style="list-style-type: none"> • Mayor of Xalapa; • Municipal Council of Xalapa; • Municipal Commission for Water and Sanitation (CMAS); and • Municipality of Tlalnelhuayocan
Private sector	<ul style="list-style-type: none"> • Salvadorian association of engineers and architects ASIA. 	<ul style="list-style-type: none"> • Caribbean Institute of Media and Communications (CARIMARC); • Interamerican Development Bank (IDB); • Latin American Energy Organisation (OLADE); • CEAC Solutions Company; and • Urban Development Cooperation; 	<ul style="list-style-type: none"> • Planning, Development and Environmental Restoration (PLADEYRA); and • Interamerican Development Bank (IDB).
NGOs	<ul style="list-style-type: none"> • Oxfam; • CORDAID • AECID; • Oikos Portugal • Red Cross Switzerland; • Geologos del Mundo; 	<ul style="list-style-type: none"> • UNEP (country office); • UNDP; • Caribbean Youth Network; • The Nature Conservancy; • USAID; • ACIDI/VOCA; and 	<ul style="list-style-type: none"> • Mexican Fund for Nature Conservation (FMCN); and • SENDAS AC.

	<ul style="list-style-type: none"> • UNES; • ACUA; • PRISMA; • PROCOMES; • Engineers without borders; and • Foro del Agua. 	<ul style="list-style-type: none"> • PANOS. 	
Research institutes	<ul style="list-style-type: none"> • University El Salvador (UES); and • University Catolica (UCA) 	<ul style="list-style-type: none"> • University of the West Indies (UWI); • Climate Study Group, Mona; • University of Technology; and • The Jamaica Bauxite Institute; 	<ul style="list-style-type: none"> • Institute of Ecology (INECOL); • University of Veracruz; • Colegio de Veracruz; • Centre for Earth sciences, University Veracruz; and • Centre for Climate Studies.

2.6. Baseline analysis and gaps

Component 1: Enabling environment for mainstreaming EbA into medium- and long-term urban development planning

138. Cities in the LAC region are increasingly experiencing the effects of climate change. For example, parts of San Salvador, Kingston and Xalapa are regularly flooded as a result of above average intense rainfall and inadequate infrastructure for managing the infiltration of rainwater. In response to these effects, several countries – including El Salvador, Jamaica and Mexico – have developed policies and strategies to adapt to climate change. For example, the MARN in El Salvador developed the National Environmental Strategy (ENMA), National Climate Change Strategy and First National Climate Change Plan. However, the concept of climate change adaptation – including EbA – is not yet integrated into urban development planning such as within the urban development department of San Salvador. Similarly, Jamaica has developed several climate related plans, strategies and policies, including the Climate Change Policy Framework developed under the Climate Change Adaptation and Disaster Risk Reduction (CCADRR) project. Despite these frameworks the integration of climate change adaptation into other sectors has been limited. In Mexico, several institutional and legal frameworks exist to establish adaptation criteria for climate change, such as: i) the General Law on Climate Change (LGCC); ii) la ENCC, Visión 10-20-40; iii) el PECC 2014-2018; iv) a state law on mitigation and adaptation to the effects of climate change for Veracruz; and v) a climate change action programme for Xalapa, which is currently under review. However, the efficacy at local scale of these policies and strategies in the three countries is reduced because limitations still exist among government authorities regarding budgetary and technical capacity to implement as well as enforce policies and strategies. Furthermore, policies and strategies are not always consistent with the latest scientific developments on climate change. Consequently, the management of environmental policies and priorities within the context of multilateral agreements remains a major challenge for the authorities of these cities¹¹³.

¹¹³ Garcia, K. and Zegarra, J.K. 2012. Global Environmental Outlook 5. Environment for the future we want. Chapter 12: Latin America and the Caribbean. UNEP.

139. Similarly, climate change programmes¹¹⁴ in the LAC region have provided training to increase the capacity of local and national governments to integrate climate change considerations into development planning. However, these government representatives have not been trained on planning and implementing large-scale and widespread urban EbA as a cost-effective and low-risk approach to adaptation. Policy- and decision-makers have limited awareness of EbA as a cost-effective and low-risk approach to achieving development objectives under conditions of climate change. Consequently, urban EbA has not been integrated into policies, strategies and plans that underpin governance of urban ecosystems and construction in these areas. National budgets and funding frameworks – including the Climate Finance Committee in El Salvador, the Climate and Project Committee under the National Climate Change Advisory Committee in Jamaica, and the Climate Change Fund in Mexico – have been established to support the achievement of national targets for climate change adaptation articulated in relevant national policies, strategies and plans. In addition, there is still limited coordination between government departments, the private sector and research institutions. This prevents the dissemination of relevant technical information on urban EbA and the upscaling of successful local efforts to the national and regional level.

140. As a result of limited financial and technical capacity of government departments¹¹⁵ in El Salvador, Jamaica and Mexico, EbA is not currently prioritised as a cost-effective and low-risk approach to adapting to the effects of climate change in urban areas. EbA is also not mainstreamed into medium- and long-term development planning in San Salvador, Kingston and Xalapa. More details on the current institutional framework and existing climate related policies is described per country below.

San Salvador, El Salvador

141. In 2012, El Salvador's environmental law was reformed to integrate adaptation to climate change into policies, strategies and plans. Under this law, the National Environmental Policy (PNMA)¹¹⁶ provides the framework for this integration. As one of the instruments of the PNMA, the MARN developed the National Environmental Strategy (ENMA). The ENMA consists of four separate strategies, including the National Climate Change Strategy (ENCC). The ENCC provides guidance for defining specific sectoral plans with broad participation of the Salvadoran society. Objective 2 of the strategy addresses adaptation to climate change. Priorities of action under this objective include: i) sectoral strategies for adaptation with an emphasis on agriculture, hydrology, infrastructure and health; ii) the restoration of critical ecosystems; and iii) urban and coastal planning¹¹⁷. Under the ENCC, the First National Plan on Climate Change (PNCC) has been developed. The PNCC provides the framework for the integration of climate change adaptation into the planning and management of national socio-economic sectors and ecological systems. However, an EbA approach is not included in these climate change plans and strategies as an option to adapt to the effects of climate change. In 2013, El Salvador completed its Second National Communications (SNC) to develop climate change adaptation measures for the following identified priority areas: agriculture, water, coasts and forests.

¹¹⁴ These programmes include *inter alia*: UN-HABITAT Cities and Climate Change Initiative (CCCI), UNISDR Making Cities Resilient Campaign and CARICOM's Regional Framework for Achieving Development Resilient to Climate Change

¹¹⁵ Particularly those responsible for the environment, water management and urban planning.

¹¹⁶ This State Policy was formulated by the Ministry of Environment and Natural Resources (MARN) and the National System of Environmental Management (SINAMA).

¹¹⁷ Rosa Chávez, H. 2013. Presentación "Estrategia Nacional de Cambio Climático". MARN. San Salvador.

142. The National Environmental Management System (SINAMA) is formed by the national ministries and the 262 municipalities in the country to: establish, operate and maintain the principles, standards, programmes, direction and coordination of environmental management of the state in the public sector institutions. However, as a result of limited technical, financial and institutional capacity, the SINAMA is currently unable to perform all the required tasks. The SINAMA comprises three main cross-sectoral committees. Firstly, the inter-ministerial Committee on Climate Change, which includes the MARN, MOP, MAG, the Ministry of Foreign Affairs (MREX) and Ministry of Finance (MOF). Secondly, the Office of Environmental Sustainability, which includes the MARN, MOP, MAG, the Ministry of Tourism (MITUR) and the Interior and Vulnerability Affairs Secretariat. The office is coordinated by the MARN, who also oversees the monitoring of the PNCC and the strategic programmes. And thirdly, the Climate Finance Committee, which consists of 20 central government and autonomous institutions. The Vice-Ministry of Development Cooperation, the Technical Secretariat of the Presidency and the MARN jointly serve to coordinate the Climate Finance Committee. Although several opportunities exist, there is limited inter-ministerial and cross-sectoral coordination to implement the coordination within and between these three inter-sectoral committees. The reasons for this existing limitation include *inter alia* i) not having a clear leader to promote such cross-sectoral coordination; and ii) limited awareness how to use the existing frameworks.

143. Several ministries have developed climate change strategies or plans for their own specific sector¹¹⁸. These ministries include: i) the Ministry of Public Works, Transportation, Housing and Urban Development (Management of Climate Change Adaptation and Strategic Risk Management and the Plan on Climate Change of the Infrastructure Sector and Human Settlements); ii) the Ministry of Agriculture (Environmental Strategy for Adaptation and Mitigation to Climate Change); iii) the Ministry of Education (Education Plan for Climate Change and Integrated Risk Management 2012-2022); and iv) the Ministry of Health with support from MARN (a system of bio-climate monitoring, which will strengthen the health response to climate variability). These ministries – including MARN – take climate change into account, but do not include an urban EbA approach. As a result, urban EbA is not reflected in their budgets. In addition, these strategies, policies and plans are often not implemented because of limited budget and cross-sectoral coordination.

144. The government authorities of San Salvador experience challenges with the implementation of the climate change and environmental regulations. For example, the urban development department in San Salvador is not well prepared to articulate the effects of future climate change and the use of urban EbA as an option in urban development programmes. In addition, protocols on sustainable development are limited and responsibilities for actions are often unclear.

Kingston, Jamaica

145. During the past two years, urgent action has been taken by the GoJ to: i) establish a climate change mandate under the MWLECC; ii) appoint a National Climate Change Advisory Committee (CCAC); and iii) establish the Climate Change Division (CCD) to coordinate national actions on climate change. The National Climate Change Advisory Committee is a cross-sectoral committee comprising of representatives of the government ministries, the private sector, academia and Non-Governmental Organisations and serves as

¹¹⁸ Although the tourism sector is vulnerable to climate change, the Ministry of Tourism (MoT) has not included climate change in its strategy and programmes.

a platform for providing support to the country's climate change strategies across sectors. The CCAC has three sub-committees, namely the executive committee, the finance and project committee and the technical committee. The inclusion of the Ministry of Finance and Planning (MOFP) in the CCAC will assist ministries to develop a financial strategy to incorporate the development and implementation of climate change adaptation. Under the PPCR project, a National Communication Strategy and Action Plan entitled "*Communication for Climate Resilience (2012-2017)*" has been prepared for the Planning Institute of Jamaica (PIOJ). In addition, Jamaica has developed several climate related plans, strategies and policies. The main one being the Climate Change Policy Framework developed under the Climate Change Adaptation and Disaster Risk Reduction (CCADRR) project, which currently has been approved by the cabinet. This framework and action plan – guided by Jamaica's Second National Communications on Climate Change (See section 3.6) – intends to support the goals of Vision 2030: Jamaica National Development Plan by reducing the risks of climate change to all of Jamaica's sectors and development goals. Furthermore, a Focal Point Network – comprising 27 representatives from ministries, departments and agencies – has been established to support the Government's implementation of the climate change framework¹¹⁹.

146. Although the GoJ has initiated these urgent actions, the integration of climate change adaptation into national social and economic policies has been slow. While the policy framework for adaptation in urban areas exists, under the baseline scenario there is still limited: i) awareness of EbA among government officials and technocrats responsible for reviewing and drafting the environmental policies and laws; and ii) technical capacity among decision-makers from relevant departments on urban development to address the effects of future climate change and use EbA as an option in urban development programmes; and iii) on-the-ground coordination between the sectoral initiatives¹²⁰. This hinders the implementation of adaptation interventions – in particular EbA – in the urban landscape.

147. In general, the development planning system of Jamaica is adequate but implementation is weak with limited effect. This has resulted in: i) the proliferation of informal settlements; ii) illegal removal of forests and consequent reduction in natural resources and biodiversity; and iii) the destruction of natural coastal resources. To address this challenge there is a need to strengthen the enforcement mechanism and implementation modalities for effective land use planning. This includes developing a planning framework that bridges the gap between environmental and economic development, improves local governance and educates public stakeholders.

Xalapa, Mexico

148. A lot of progress has been made since the first National Communication in 1997 regarding climate change adaptation. In 2012, Mexico completed its Fifth National Communication and is currently preparing its Sixth National Communication to be published in 2016. Progress has also been made regarding the development of legislation and policies on adaptation to climate change. This is demonstrated through the availability of a framework

¹¹⁹ http://www.jamaicaobserver.com/environment/Gov-t-establishes-network-to-implement-climate-change-provisions_16308272. Accessed on 21 July 2014.

¹²⁰ These sectors include inter alia: agriculture, tourism, health, water, forestry, land use, and marine and terrestrial – ecosystems.

for cities in Mexico to adapt to the effects of climate change¹²¹. In April 2012, the Mexican Congress approved the General Law on Climate Change (LGCC), which established the National System for Climate Change (SINACC) to coordinate between the three levels of government¹²² and the participation of public and private sectors to reduce risk and vulnerability to climate change. The SINACC comprises the following three entities: i) the Inter-Ministerial Commission on Climate Change (CICC); ii) the National Institute of Ecology and Climate Change (INECC); and iii) the Climate Change Council (C3) in which designated members of the private sector, public sector and academia participate. In addition, the SINACC allows for the participation of members of Congress and local authorities. The CICC is responsible for coordinating the climate public policies at the Federal Government. The latest Intended Nationally Determined Contribution (INDC), explicitly recognised EbA as an option to adapt to climate change. However, awareness on EbA in the urban context is still limited. More information regarding the INDC is addressed in Section 2.4.

149. The National Strategy on Climate Change Vision 10-20-30 (ENCC) was developed to guide Mexico's medium- and long-term national policies to adapt to the effects of climate change and the transition towards a more sustainable, competitive and low carbon economy. The strategy provides a set of policies and an action plan to guide policy-making processes at all levels of government and to promote coordination with other sectors. These policies include the conservation of ecosystems and the related environmental services, which are equivalent to EbA although not mentioned as such specifically. In the ENCC, there are multiple references to urban dimensions. However, they refer mostly to mitigation or civil protection. Adaptation in an urban context is not mentioned in the ENCC. For short-term planning, the Special Programme for Climate Change (PECC) was set up. This programme complements the ENCC and prescribes climate actions to be implemented in the period 2014–2018¹²³. The Federal Public Administration is responsible for: i) making use of financial resources allocated by the Congress to implement the PECC; ii) assigning responsibilities across the ministries that are involved; and iii) undertaking monitoring and evaluation, the latter being the specific responsibility of INECC. In addition, a Climate Change Fund was established by the LGCC to mobilise public, private, national and international financial resources to support the implementation of climate actions of the ENCC and PECC. Although adaptation measures are given priority to use the resources from this fund, little attention is provided to use EbA to adapt to the effects of climate change. The law instructs that the fund addresses both adaptation and mitigation to increase natural capital, reduce deforestation and sequester carbon.

150. At the Veracruz state level, several institutional arrangements have been made between 2011 and 2013 to promote adaptation to climate change. These arrangements include: i) the establishment of a State Secretary for the Environment (SEDEMA) responsible for climate change state policies and actions; ii) the Programme of Veracruz on Climate Change (PVCC) embedded within the State Development Plan (2011–2016); and iii) the establishment of the Council of Veracruz for Mitigation and Adaptation to coordinate efforts from different institutions and sectors to mainstream climate change in the State development plans. The PECCs serve to support planning and development of public policies and action on climate change and to strengthen the decentralisation process and

¹²¹ Hardoy, J., et al. 2013. Institutionalising climate change adaptation at municipal and state level in Chetumal and Quintana Roo, Mexico. *Environment and Urbanisation*. 26:69–85.

¹²² These levels include Federal, State and Municipal.

¹²³ This period is aligned with the current presidential administration.

sustain policies and actions related to climate change at the state level. The Environmental Fund of Veracruz was also created.

151. In 2012, a Municipal Climate Action Plan for Xalapa was approved and developed with the support of ICLEI – Local Governments for Sustainability, while funded by the United Kingdom. The plan is in line with the plans and strategies of INECC and SEMARNAT. In addition, the plan promotes interventions in urban infrastructure systems to *inter alia* i) build drainage systems; ii) upgrade green areas; iii) protect dry riverbeds and unstable slopes; iv) develop risk maps; and v) guide land use planning at the local level. For Xalapa, however, the specific projects that could be derived from the action plan were never fully formulated or financed. In addition, the action plan does not include the EbA approach as an option to adopt to the effects of climate change. Xalapa’s action plan is currently under review.

152. Overall, the coordination between local governments in Mexico has been limited. In 2005, however, the municipalities of Acajete, Banderilla, Rafael Lucio, Tlalnehuayocan and Xalapa signed an agreement to address conflicts arising from the management of the river Sedeño. Furthermore, the development plan for the city of Xalapa for the period 2014–2017 proposes a stronger cross-sectoral integration to improve the social, economic and ecological sustainability of its inhabitants¹²⁴.

Component 2: Demonstration of urban EbA interventions to establish climate-resilient communities.

153. Governments in the LAC region are currently focussed on addressing environmental and socio-economic problems to improve the well-being of urban communities. In particular, the governments of El Salvador, Jamaica and Mexico are implementing initiatives that focus on water conservation, environmental protection and pollution control¹²⁵. However, these initiatives do not explicitly include consideration of the effects of climate change. Furthermore, none of these initiatives include explicit consideration of EbA as a cost-effective approach to achieving socio-economic development under future climate conditions. The cost of the expected effects of extreme climatic events in the LAC region is currently estimated at US\$250 billion¹²⁶.

154. The effects of future climate change will exacerbate many of the current problems affecting urban communities. For example, urban expansion of San Salvador, Kingston and Xalapa, has replaced ecosystems and green areas at the watershed, urban and household scale with concrete infrastructure and asphalt, a process called “catchment hardening”. During periods of extreme rainfall, these hardened catchments cannot absorb large amounts of water. Consequently, rainwater remains on the hardened surfaces and results in flooding within the city, particular in areas with poor communities who have limited access to financial and natural resources to adequately respond to such extreme rainfall.

155. Urban communities in San Salvador, Kingston and Xalapa are currently not sufficiently prepared to adapt to the future effects of climate change. This because initiatives in these cities that focus on the construction of infrastructure to improve the well-being of

¹²⁴ Plan Municipal de Desarrollo 2014–2017 de Xalapa.

¹²⁵ UN. 2012. Water and a Green Economy in Latin America and the Caribbean (LAC). UNECLAC Natural Resources and Infrastructure Division and the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC).

¹²⁶ ECLAC - IDB. 2010. Climate Change: A regional perspective. Santiago, Chile: United Nations.

urban communities – including water basins and storm water drains¹²⁷ for water management – do not include EbA as an approach to increase the resilience of such infrastructure and urban communities under conditions of climate change. In addition, initiatives that focus on rehabilitation of vegetation to mitigate the impacts of climate-related disasters – including activities undertaken by the Forestry Department (FD) and National Environment and Planning Agency (NEPA) in Kingston – do not integrate climate scenarios in the selection of species, and consequently climate-resilient species will not be used for restoration. The efficacy of these activities is therefore constrained by the negative effects of climate change. More details on the baseline situation regarding adaptation to climate change are described below for each country and city.

San Salvador, El Salvador

156. Currently, 93 out of the total 514 informal urban neighbourhoods in the AMSS are identified as areas at high risk of landslides and floods. Of these 93 neighbourhoods, 29 fall within the extreme or high poverty groups¹²⁸. The effects of climate change will further increase this risk to these baseline problems, particularly for these poor urban communities. There are several projects in El Salvador working on climate change adaptation, however they do not include EbA in an urban context. For example, the National Ecosystem and Landscapes Restoration Programme from the MARN includes ecosystem-based adaptation, however, this programme has a rural focus. Similarly, there are a few NGOs working on climate change adaptation including EbA, but only in rural areas. To date, only one local NGO – PROCOMES – has implemented minimal urban EbA interventions – such as planting green barriers and developing urban-family orchards in the AMSS. However, the knowledge on the benefits and lessons learned from these interventions by the national government and NGOs has not been shared with other sectors and institutions and as a result there is limited proof-of-evidence on the benefits of implementing urban EbA.

Kingston, Jamaica

157. The vulnerability of the population in Kingston is influenced strongly by natural disasters and other non-climate related threats – as described in Section 2.3¹²⁹. The effects of these natural disasters will be exacerbated by predicted climate change and consequently pose an increased threat to the livelihoods of urban communities in Kingston¹³⁰. To address the effect of flooding and erosion in Kingston, the Forestry Department (FD) has replanted since 2010 more than 600 hectares of forest in degraded upper watershed areas to reduce run-off, erosion and silting of waterways¹³¹. In addition, the National Environment and Planning Agency (NEPA) has restored the natural coastline in the Portland Bight protected area by replanting mangrove trees near some of Jamaica's most vulnerable communities¹³².

158. The adaptation interventions implemented by the FD and NEPA demonstrate the existing experience of using EbA to adapt to the effects of climate change. However, these

¹²⁷ These projects include the IDB project “reducing the vulnerability in urban settlements” in San Salvador, El Salvador and the Integrated Community Development project (ICDP) in Kingston, Jamaica.

¹²⁸ IADB. 2011. Reduction of vulnerability in informal urban neighbourhoods in the AMSS.

¹²⁹ For example, five major storms between 2004 and 2008 caused US\$1.2 billion in losses and damage .

¹³⁰ Michael A. Taylor, “Why Climate Demands Change” Presented at GraceKennedy Foundation Lecture 2015, Kingston, Jamaica.

¹³¹ This included ~405 hectares in the upper watersheds of the Hope River, Yallahs River & Rio Bueno and ~200 hectares in the Stephney- John's Vale Forest Reserve

¹³² <http://www.ipsnews.net/2012/04/working-to-cope-with-climate-change-jamaica-calculates-costs/>. Accessed on 21 July 2014.

EbA interventions are limited in that they only address the watershed level and do not take the urban landscape and household level into account. As a result, urban communities in Kingston are still vulnerable to the predicted effects of climate change.

Xalapa, Mexico

159. As in most Mexican cities, climate change adaptation – including EbA – has to date received very limited institutional attention in Xalapa. Although the municipal plan mentions the need to have an efficient Civil Protection System to protect against natural disasters, it does not take into account the effects of climate change on the city. Moreover, the Municipal Plan of Action for Climate Change has not been enforced and no adaptation projects – including those related to urban EbA – have been implemented.

Component 3: Knowledge and awareness of urban EbA throughout the LAC region

160. Currently, climate change programmes and initiatives underway in the LAC region – such as CCCI, Making Cities Resilient and EUROCLIMA – are increasing knowledge and awareness of the effects of climate change in national governments. This knowledge, however, is not communicated effectively to local governments. In addition, knowledge and awareness-raising activities, often have a focus on climate change mitigation rather than on adaptation. As a result, relevant local government entities, city management authorities and other stakeholders in El Salvador, Jamaica and Mexico have limited knowledge of climate change adaptation in general, and almost no knowledge of urban EbA. Consequently, EbA is not implemented or integrated into urban development planning.

161. Several research institutions in the LAC region have developed curricula and started programmes on climate change adaptation and EbA. For example, CATIE in Costa Rica has a special Climate Change and Watersheds programme¹³³ and offers an MSc in Economics, Development and Climate Change¹³⁴. However, national and local policy- and decision-makers often do not request research results from these institutions. In addition, there is limited cross-institutional coordination between government departments, the private sector and research institutions. As a result, policy- and decision-makers within the relevant government departments are not adequately informed on the most recent and cost-effective interventions to adapt to climate change. Consequently, such interventions are not incorporated into existing urban development plans. More detailed information on the current available knowledge and awareness on climate change and EbA is described per country below.

San Salvador, El Salvador

162. In the past decade, the increased frequency and intensity of storms – particularly Ida in 2009 and tropical depression 12E in 2011 – has led the GoES to triple the number of weather stations across the country¹³⁵. In addition, an Integrated Centre to Monitor Threats (CMIA) was established to complement a network of local observers. These weather stations have served to strengthen the functioning of the early warning systems and the national system for civil protection. Consequently, more information has been available to prepare the general public for natural disasters. This increased awareness of natural disasters –

¹³³ <http://www.catie.ac.cr/en/what-we-work-on/climate-change>. Accessed on 7 April 2015.

¹³⁴ <http://www.catie.ac.cr/en/education-programs/posgrado/specializations>. Accessed on 7 April 2015.

¹³⁵ The number of weather stations tripled from 34 in 2009 to 102 in 2013.

including climate-change induced extreme events – ostensibly led to a reduction in the number of deaths caused by extreme events, from 198 in 2009 to 12 in 2010¹³⁶.

163. In El Salvador, several research institutions offer a research programme on Climate Change. Firstly, the Salvadoran Foundation Research Program on Development and Environment, Prisma¹³⁷, focuses on climate change mitigation and works closely with the MARN and secondly, the NGO Salvadoran Ecological Unit (UNES)¹³⁸ focuses on the effects of climate change and projecting local climate scenarios. UNES also works on rural EbA in marine and mountain ecosystems. Lastly, the Science Department of the University of El Salvador – with the support of OXFAM – has developed the Metropolitan Risks Observatory that uses GIS to: i) follow up on the effects of climate change in the AMSS; and ii) identify the most vulnerable areas. The observatory is able to indicate the location of early warning systems, hard infrastructure or EbA interventions and to monitor and view adaptation efficiency.

164. The Planning Office of the Metropolitan Area of San Salvador (OPAMSS) has formed a local development school¹³⁹. This school offers seminars, courses and exchanges in three areas including: local development, social cohesion and land management. Although there is no particular focus on climate change, the school offers an opportunity to train local government on the development, implementation and monitoring of urban EbA interventions. To date, no specific studies of urban EbA have been undertaken. There are NGOs working in water management, risk management and food security that apply the concept of ecosystem-based adaptation without being aware of the concept¹⁴⁰. However, these NGOs are working in the rural areas of El Salvador. The results of the work from these NGOs are currently not being used by the government of El Salvador for replication elsewhere, including in urban environments.

Kingston, Jamaica

165. The Caribbean Meteorological Organization (CMO) is a specialised agency of CARICOM, located in Port of Spain, Trinidad and Tobago. It coordinates joint scientific and technical activities on weather-, climate- and water-related sciences in 16 English-speaking Caribbean countries¹⁴¹. In addition, the Caribbean Institute for Meteorology and Hydrology (CIMH) – located in Barbados – is a training and research organisation formed by integrating the Caribbean Meteorological Institute (CMI) and the Caribbean Operational Hydrological Institute (COHI). The main functions of the CIMH are to: i) operate as a research centre on meteorology and hydrology and associated sciences; ii) provide advice to participating governments on meteorological and hydrological matters; and iii) collect, analyse, and publish meteorological and hydrological data.

166. In Jamaica, there are a number of tertiary institutions that have been undertaking research on climate change in specific areas. For example, the Climate Studies Group, Mona

¹³⁶ Chavez, H.R. 2013. Presentación Estrategia Nacional de Cambio Climatico. MARN. 22 April 2013.

¹³⁷ <http://www.prisma.org.sv/>. Accessed on 14 April 2015.

¹³⁸ <http://unes.org.sv/>. Accessed on 14 April 2015.

¹³⁹ http://www.opamss.org.sv/index.php?option=com_content&view=article&id=13&Itemid=138. Accessed on 14 April 2015.

¹⁴⁰ Personal communication between the National Consultant and representatives of the NGO on 23 April 2015.

¹⁴¹ The sixteen member countries participating in the CMO include Anguilla, Antigua and Barbuda, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts/Nevis, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, and the Turks and Caicos Islands.

(CSGM) of the University of the West Indies serves as a central repository for opinion, analysis and expertise on climate change science. Moreover, the CSGM is widely regarded as a national and regional research entity to be consulted on matters related to the science of climate change. Other tertiary institutions undertaking climate change research include: i) the Centre for Marine Science, University of the West Indies (UWI); ii) the School of the Built Environment, the University of Technology (UTEC); iii) the Northern Caribbean University (NCU); and iv) the Sir Arthur Lewis Institute of Social and Economic Studies, UWI. Notably, the UWI at St. Augustine has signed a Memorandum of Agreement (MoA) with the Caribbean Community Climate Change Centre (CCCCC) to cooperate and undertake joint research, education, training and institutional strengthening on all aspects of climate change to benefit not only the CARICOM region, but also the entire international community¹⁴². However, these research institutions increasingly experience limited financial and human resources to develop and implement programmes on climate change, including urban EbA. As a result, there is limited research available to provide an evidence-base on the benefits of urban EbA.

167. Although scientists in Jamaica have a basic understanding of the effects of future climate change, they are constrained putting this knowledge into practice. This is as a result of: i) inaccurate predictions by global models on climate change in the Caribbean; and ii) limited technologies in Jamaica to make accurate predictions on climate change. Consequently, scientists in Jamaica continue to experience several challenges, including the limitation of data availability for monitoring and to model climate change. In addition, the use of appropriate technologies to collect data is further limited by the high costs.

168. Under the Climate Change Adaptation and Disaster Risk Reduction Project (2011-2013) – executed by the EU and UNEP – an awareness campaign on climate change was implemented. This campaign assisted the government in raising awareness regarding climate change at the local level, particularly in watersheds and coastal areas. However, this campaign and the awareness raising activities did not include the concept of EbA. As a result, there is still a limited awareness among local authorities and communities in Kingston on urban EbA as an approach to adapt to the effects of climate change.

Xalapa, Mexico

169. In Mexico, there are several academic programmes on climate change that have been established in national institutions to strengthen national capacities in the field of climate change adaptation. At an undergraduate level, these institutions include *inter alia*: the Universidad Autónoma de Aguascalientes and the Universidad Nacional Autónoma de México (UNAM). At a graduate level, there is a Master of Science in: i) Climate Change and Sustainability offered by Instituto de la Investigación en Procesos de Calidad in Monterrey; ii) Climate Change by the Fundación Universitaria Iberoamericana (FUNIBER); iii) Climate Change Studies¹⁴³ through the Universidad Iberoamericana in Puebla; and iv) Adaptation to Climate Change, in the Centro del Cambio Global y la Sustentabilidad en el Sureste A.C.¹⁴⁴.

170. Research on climate change and its effects is undertaken by different academic institutions in Mexico, including *inter alia*: i) UNAM, Instituto Politécnico Nacional, Universidad Iberoamericana; ii) Centro de Cambio Global y Sustentabilidad en el Sureste; iii)

¹⁴² http://www.caricom.org/jsp/secretariat/legal_instruments/mou_macc_ccccc.pdf. Accessed on 17 April 2015.

¹⁴³ This course is currently discontinued.

¹⁴⁴ Under preparation; expected to be operational in 2016.

Instituto de Ecología (INECOL, in Xalapa); iv) Universidad Veracruzana; v) Instituto Mexicano de Tecnología del Agua; and vi) Centro de Información y Comunicación Ambiental de Norte América. The Atmospheric Science Centre (SCA) of UNAM – in collaboration with SEMARNAT, INECC and several conservation NGOs – has undertaken awareness raising initiatives on climate change and the importance of green area within and around the city to the general public through different media. However, the public awareness on the topic is still limited. Although the National Commission of Natural Protected Areas (CONANP) has introduced EbA as a guide for adaptation strategies, EbA remains a relatively unexplored concept in urban planning across the country.

Overall

171. There are multiple factors that influence the adaptive capacity of urban communities in San Salvador, Kingston and Xalapa to the effects of climate change. These include *inter alia*: i) the level of poverty and education of urban communities; ii) the type of housing conditions and infrastructure within the city; and iii) the health of urban and peri-urban ecosystems. The extent of these problems varies by country and by city. However, the following five barriers are common across the three selected cities that prevent urban communities from adopting an urban EbA approach to adapt to the predicted effects of climate change (see Section 2.1). Firstly, limited awareness and institutional capacity exists within national and local government on urban EbA. This results in urban EbA not being integrated into the major national and municipal development plans. Secondly, there is limited technical capacity within local government to plan and implement urban EbA because of limited on-the-ground interventions to provide reference and lessons learned. Thirdly, the willingness of local and national government to respond to the effects of climate change. Fourthly, the current financial, institutional and technical capacity of local and national government to respond to the effects of climate change is limited. Fifthly, research institutions have minimal access to financial and human resources to undertake research and publish results in peer-reviewed papers and other media. As such, it is challenging to raise the awareness of the general public on the benefits of urban EbA interventions.

National Baseline Projects

172. In San Salvador, the problem that the baseline project is addressing is the vulnerability of urban communities to flooding and landslides as a result of land-use change. The predicted effects of climate change – including increased rainfall variability – will exacerbate the frequency and intensity of flooding and landslides. However, the baseline project does not consider these climate change effects. The SCCF-financed project will therefore build on the activities of the baseline project to assist urban communities to adapt to climate change.

173. San Salvador – **Reducción de Vulnerabilidad en Asentamientos Urbanos Precarios (AUP) del AMSS** (2013–2018). This US\$50 million project – of which US\$21,689,000 is co-financing for the SCCF-financed project – is a MOP project financed by the IDB. The objective of the project is to reduce the vulnerability of urban communities in AUP to floods and landslides while also improving their livelihoods. This objective will be achieved through three components focussed on: i) reducing the vulnerability of informal neighbourhoods to flooding through the construction and maintenance of infrastructure such as basins and culverts in the Metropolitan Area of San Salvador (AMSS); ii) improving basic sanitation infrastructure in informal neighbourhoods in the AMSS through risk mitigation

works and resettlement; and iii) strengthening the operational management of the government.

The predicted effects of climate change – including increased intensity of rainfall events as well as increased duration and severity of dry periods – will lead to greater frequency and intensity of climate-related disasters such as flooding, landslides and droughts. These climate-related disasters will place additional pressure on the infrastructure that is presently being constructed by the AUP project to protect urban communities. This infrastructure will consequently be at increased risk of damage and will require costly maintenance at more frequent intervals under future climatic conditions.

Through the SCCF-financed project, urban EbA measures will be implemented to complement the infrastructure that is being constructed by the AUP project. In particular, the project will build on this initiative by: i) constructing infiltration ditches on the slope of the San Salvador volcano to increase water infiltration on these slopes and to reduce runoff (Output 2.3); ii) developing a watershed management plan for Arenal-Monserrat in alignment with the drainage master plan for this area; iii) implementing climate-resilient restoration interventions at watershed scale to reduce the risk of flooding and landslides (Output 2.3); iv) creating infiltration wells¹⁴⁵ to complement existing initiatives that increase the water infiltration rate to reduce the risk of flooding during periods of intense rainfall and overcome water shortages during periods of drought (under Output 2.3); and v) providing training to representatives of the MOP on the benefits of EbA for managing climate change risks. The training provided under Outputs 1.3, 2.3 and 2.4 will increase technical and institutional capacity of government authorities and urban communities in San Salvador, Kingston and Xalapa to plan and implement urban EbA interventions and improve climate-resilient livelihoods. The government authorities involved include the MARN and MOPTVDU in El Salvador, the MWLECC in Jamaica and INECC as well as the municipality of Xalapa in Mexico.

Jamaica

174. In Jamaica, the problem that the baseline project is addressing is the increased flooding in the downtown area of Kingston as a result of catchment hardening and the uncontrolled disposal of solid waste. The baseline project aims to address this problem by improving: i) infrastructure for water drainage and supply; and ii) household sanitation through recycling and waste collection. However, the baseline project does not take into account the future effects of climate change – such as increased frequency and intensity of rainfall and storm surges – that will increase the risk of flooding in Kingston. The SCCF-financed project will therefore build on the activities of the baseline project to make them climate-resilient and reduce the vulnerability of urban communities in downtown Kingston to the effects of climate change.

175. **Jamaica Integrated Community Development Project (ICDP) (2014–2020).** This US\$42 million project – of which US\$4 million will be co-financing – is funded by the World Bank and executed by the Jamaica Social Investment Fund. The main objective of the ICDP is to improve access to basic urban infrastructure and services, and contribute towards increased community safety in economically vulnerable and socially volatile urban communities of Jamaica. This objective will be achieved through four main components

¹⁴⁵ Infiltration wells are shallow wells which draw water into or from a natural aquifer outside of a riverbed, but which have a partial lining. These wells can be used to either drain a catchment area or recharge groundwater, especially where recharge rate of the aquifer is low.

focussed on: i) enhancing public safety and alternative livelihoods; ii) strengthening public awareness sanitation through a skills and knowledge transfer programme; iii) strengthening the capacity of government to manage urban environments and communities; and iv) improving project administration.

The predicted increase in rainfall intensity as a result of climate change will increase the risk of flooding in Kingston. Such flooding is expected to damage infrastructure – including roads and storm water drains – that is being constructed or repaired by the ICDP project. These climate-related damages will undermine the objective of the ICDP project to improve the access of local communities to basic urban infrastructure and services. The activities of the SCCF-financed project will consequently increase the climate-resilience of the ICDP project against flooding by restoring vegetation in watersheds, thereby increasing water infiltration and reducing rainwater runoff during periods of intense rainfall. As a result, the risk of flash floods in Kingston will decrease. To ensure the resilience of the interventions to the prolonged droughts predicted by climate change models, drought-resilient plant species will be used for the restoration. As a result of the deeper root system and soil-binding characteristics of these plant species, the restored areas will also be less prone to erosion and landslides during periods of intense rainfall. Additionally, the SCCF-financed project will provide direct benefits for one of the target communities of the ICDP by demonstrating additional climate-resilient livelihoods and the role of solid waste management to reduce blockages in waterways. In so doing, the incidence of floods and water-borne disease will be decreased. Within Component 1 of the SCCF-financed project, the capacity of government stakeholders within the ICDP – including MWLECC and the Ministry of Transport, Works and Housing – will be strengthened to plan and implement EbA as a cost-effective approach; this will contribute to the overall objective of the ICDP to reduce the vulnerability of local communities.

Mexico

176. In Xalapa, during its urban expansion throughout the last decades, the impacts of restricting the width of waterways, the removal of vegetation in cities for infrastructure and the building on wetlands and riverbeds were not taken into account. As a result, water flow is currently restricted and results in an increased frequency of flooding in the city. This is exacerbated by: i) the disposal of solid waste that is blocking natural drainage channels and water waterways; ii) limited maintenance of existing rainwater drainage and waterways; and iii) the current and future effects of climate change. The baseline project is currently addressing the problem related to water drainage infrastructure, but it does not consider the predicted effects of climate change that will exacerbate the flooding. The SCCF-financed project will therefore build on the activities of the baseline project to make the activities climate-resilient and consequently reduce the vulnerability of urban communities to the effects of climate change.

177. **Reducción de Vulnerabilidad por gestión de aguas pluviales en la Cuenca del Río Carneros, AMX: Proyecto Fernando Gutiérrez Barrios (FGB).** (2015–2017). In collaboration with the government of the state of Veracruz and the Secretariat of Environment and Natural Resources (SEMARNAT), this project is funded by the National Water Commission (CONAGUA) on potable water. Phase I of the FGB project has a budget of US\$1.3 million and will end in 2017. Phase II of the project will commence in 2018 with the financial support of the Municipality of Xalapa. The total amount of co-financing committed to the SCCF project by the FGB project is US\$3,120,000 over the period of 2016–2020. The main objectives of this project are to: i) improve sanitation infrastructure in six neighbourhoods; ii) improve water treatment in PTAR II; and iii) reduce vulnerability of local

communities to floods by improving drainage systems. The project aims to benefit 15,000 people in Perseverancia, Santa Lucia and Unidad y Trabajo, D.S. San Bruno, Montevideo, 24 de Abril, and San Andrés Tlalnehuayoc.

178. Over the past few decades, unplanned expansion of urban areas of Xalapa has resulted in clearing of forests and the inadequate management of its waterways including wetlands, rivers and storm-water drains. For example, the disposal of solid waste into these waterways obstructs the flow of water and results in flooding. In addition, forests, riparian corridors and wetlands have been cleared for agriculture and urban infrastructure. As a result, these ecosystems no longer provide services such as the regulation of water flow. This has resulted in an increased frequency and intensity of flooding in the city, particularly under conditions of more intense rainfall events. The activities of the SCCF-financed project will increase the resilience of the FGB project to climate-related increases in frequency and intensity of flooding by restoring cloud forests and riparian corridors, establishing an artificial wetland and constructing permeable pavements. As a result, infiltration of rainwater into the ground will be improved and the risk of flash floods as well as consequent damage to drainage and other infrastructure being constructed by the FGB project will be reduced. In addition, increased infiltration of rainwater into the ground will recharge aquifers, improving the water security of urban communities during periods of drought.

Regional Projects for co-financing

179. The problem that the regional baseline project is addressing is the continuing ecosystem degradation and the associated decline in biodiversity in the LAC region. This has resulted from the limited awareness and technical capacity of government authorities and the private sector with respect to the economic contribution of ecosystems and biodiversity to the national economy and local livelihoods. This limited awareness and capacity leads to the ongoing degradation of ecosystems and consequently the increased vulnerability of urban communities to natural disasters. The SCCF-financed project will therefore climate-proof – or align with – a number of regional baseline projects. These projects are described in more detail below.

180. The **Regional Gateway for Technology Transfer and Climate Change Action for Latin America and the Caribbean (REGATTA)**. REGATTA is funded by the governments of Spain and Norway and will be implemented until December 2016. A total of US\$250,000 will be used as parallel co-financing for the SCCF-financed project. This co-financing pertains to REGATTA's development of the knowledge-sharing platforms and communities of practice, which are expected to continue operating beyond the duration of the SCCF-financed project. Aside from helping countries to meet their technology requirements for low carbon and climate-resilient development, REGATTA aims to contribute to the implementation of the Climate Technology Centre and Network (CTCN) in the region. This regional framework is supporting the mainstreaming of climate change adaptation into National Development Plans (NDPs). Furthermore, close collaboration between knowledge centres, governments and experts has been promoted to undertake vulnerability assessments and identify relevant adaptation strategies. This type of dialogue is crucial for the National Adaptation Plan (NAP) process in participating countries. The knowledge-sharing component of REGATTA involves three sub-regional ("Andes", "MesoAmerica" and "Southern Cone and Gran Chaco") and two thematic ("Health" and "EbA") web-based communities of practice for climate change adaptation. Under the SCCF-financed project, UNEP will support countries in the LAC region to strengthen capacity, share knowledge and pilot experiences on technologies for climate change adaptation and mitigation. The SCCF-financed project will collaborate closely with

REGATTA to: i) strengthen the institutional capacity of government authorities under Component 1; ii) demonstrate technologies for climate change adaptation by implementing urban EbA interventions at three scales across three pilot cities under Component 2; and iii) share knowledge using the communication strategy and existing knowledge platforms to disseminate the preliminary results of the EbA interventions under Component 3.

181. **The Green Climate Fund (GCF) Readiness Programme** is funded by the German is funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), UNEP, the United Nations Development Programme (UNDP) and the World Resources Institute (WRI). In El Salvador, the programme is jointly implemented by UNEP and UNDP. A budget of US\$620,000 has been allocated for UNEP activities of which US\$100,000 will be used as co-financing for the SCCF-financed project. As the new operating entity of the UNFCCC's financial mechanism, access to the GCF will require strong capacity to plan and implement adaptation interventions by governments and other actors as they prepare for scaled-up financing of adaptation and mitigation measures. The GCF Readiness Programme is currently supporting developing countries to effectively and efficiently access, manage, deploy and monitor climate financing. In six pilot countries¹⁴⁶ – including El Salvador and Colombia – partner institutions will: i) offer needs-oriented capacity building and support to enable these countries to directly or indirectly access the GCF; ii) help develop investment roadmaps based on national climate change strategies, plans and policies, including through the active involvement of the private sector; and iii) assist in setting up in-country monitoring and tracking systems for climate finance and its effectiveness. The lessons learned will be shared with the GCF Board and Secretariat as well as other initiatives dedicated to enhancing readiness for climate finance.

182. In El Salvador, the objectives of the GCF Readiness Programme are to: i) improve institutional capacities to manage climate finance at different government levels, including the capacity to design and implement the institutional arrangements for the National Implementation Entity (NIE); ii) improve capabilities of Small and Medium-Sized Enterprises (SMEs), micro-enterprises, and executing entities to design projects; iii) enhance access and management of climate finance to increase the efficiency of project implementation and yield greater environmental and social benefits; and iv) build the capacity of government authorities to produce a project portfolio for climate finance with the support of the Inter-Institutional Committee for Climate Finance. The SCCF-financed project will take lessons learned from the GCF Readiness Programme in El Salvador regarding engagement with the private sector to finance initiatives to adapt to climate change. In addition, the project will build on the capacity of the government authorities to produce project portfolios for climate finance and the development of sustainable financing strategies as part of the upscaling strategy for EbA under Output 1.4.

183. The **EUROCLIMA** programme is a regional partnership between the European Union and Latin America focused on climate change. The programme will run until 2016 and has a total budget of €17.5 million. The objective of the programme is to improve the knowledge of decision-makers and scientists in Latin America on the effects of climate change to strengthen sustainable development strategies. Specifically, the programme aims to facilitate the integration of climate change mitigation and adaptation into national and (sub-) regional public development policies and plans in Latin America. The programme is active in *inter alia* El Salvador and Mexico. Under Component 1, the SCCF-financed project will build on the

¹⁴⁶ These six countries include: Colombia, El Salvador, Benin, Ghana, Fiji and Nepal.

activities undertaken by the programme to integrate EbA into the national and local development policies and plans. UNEP-ROLAC is implementing a component of EUROCLIMA, promoting climate legislation in main LAC countries (financing of US\$1,187,500). Strong synergies with this initiative exist at the legislation level to include urban EbA guidelines as part of the adaptation package. A technical study will be performed on urban sustainability with a focus on transport, but with a possibility to include EbA.

2.7. Linkages with other GEF and non-GEF interventions

184. A number of Global Environmental Facility (GEF) and non-GEF national projects that include adaption to climate change have been or are currently being implemented globally and in the LAC region. The SCCF-financed project will build on, coordinate with and collate lessons learned from these projects to avoid duplication of efforts. To facilitate coordination between the SCCF-financed project and other related initiatives, one regional Project Steering Committee (PSC) and three Project Management Units (NCUs) in respectively El Salvador, Jamaica and Mexico will be established (see Section 5). The PSC and NCUs will comprise the executing entities and project coordinators of the baseline projects/initiatives. Regional projects will be coordinated by ROLAC. The Technical Committee of each country will comprise the main local stakeholders, including the project coordinators of the ongoing initiatives presented below.

Global Level

185. The LDCF-funded **Urban EbA Asia project**. The SCCF-financed project will align with this project to set an example, provide lessons learned and best-practices on how to develop and implement urban EbA across several countries.

186. The **SCCF-funded China (2014–2018)** to build climate resilience in vulnerable Africa and Asian-Pacific developing countries by providing EbA support. The SCCF-financed project is aligned with this project and is taking lessons learned on the management structure and current implementation of this project.

187. **The Non-LDC NAP Global Support Programme (GSP)**. The SCCF-financed project is aligned with this GSP programme by contributing to laying the foundation for effective, private sector involvement in climate change adaptation. For example, through the development of a sustainable financing strategy under Output 1.4. In addition, the private sector will be consulted during the implementation of the EbA interventions to gain their support for replicating and funding such interventions elsewhere in the country and/or LAC region.

188. **UNEPLive**. Under component 3, the SCCF-financed project is aligned with this initiative to facilitate the exchange and sharing of data, assessments and knowledge on climate change and ecosystem restoration between *inter alia* member countries, research networks and local communities.

189. The **Global Universities Partnership on Environment for Sustainability (GUPES)**, is UNEP's Environmental Education and Training Unit (EETU) flagship initiative. The goal of GUPES is to mainstream Environmental Education in higher education institutions, both through curricula and greening practices on campuses. It operates through EETU key 3 pillars: education, training, and networking. At present there are over 750 partner universities affiliated to GUPES worldwide. Alianza de Redes Iberoamericanas de, Universidades por la Sustentabilidad y el Ambiente (Alliance of Iberoamerican University Network for

Sustainability and the Environment (ARIUSA) is a partner network of GUPES. Both ROLAC and EETU work with this network. The SCCF-financed project will align with GUPES and ARIUSA under Component 3 and particularly Output 3.3 where the mentioned universities and research institutes in each country will collaborate closely with these initiatives to incorporate EbA practices into higher education. In addition, lessons learned from GUPES can be taken to incorporate environmental education on EbA into the educational toolkits under Output 3.4.

Regional level

190. **Biodiversity Ecosystem Services (BES) Funds Programme (2013–2016).** This programme is part of the BIO Funds and operates in most LAC countries. Currently, the programme does not operate in El Salvador and Mexico, however it aims to expand its activities to all the LAC countries. The Inter-American Development Bank (IDB) is the main funder of this programme with US\$6,26 million of which US\$2,467,000 is co-financing for the SCCF-financed project. The main goal of the BES programme is to integrate biodiversity and ecosystem services into the following economic sectors: agriculture, sanitation, transportation, tourism and water. This goal will be achieved by four objectives: i) assessing and integrating the economic value of BES into strategic economic sectors; ii) investing in protecting priority regional ecosystems; iii) strengthening effective environmental governance and policy; and iv) promoting private sector investment opportunities for innovation and environmental protection .

191. Through the BES programme, EbA has been implemented in coastal areas to increase the climate resilience of mangrove ecosystems that provide valuable services to coastal sectors. However, an EbA approach has not yet been integrated into activities to enhance the services provided by ecosystems for urban communities and economic sectors. Through a coastal project within the BES programme, mangroves have been planted in coastal areas in the Caribbean to restore mangrove ecosystems and increase their resilience against the effects of natural disasters such as hurricanes. This could be considered as a first step towards using EbA. However, an EbA approach to address the effects of climate change has not yet been integrated into activities to enhance services provided by ecosystems for urban communities and economic sectors. Consequently, the project objective to protect and sustainably manage ecosystems to demonstrate their value to these economic sectors is at risk of being undermined by the predicted effects of climate change.

192. The outcomes under the four objectives will be achieved through sub-projects, several of which are relevant to the SCCF-financed project. For example, building capacity in the economics of biodiversity and ecosystem services (US\$300,000) under objective 1. The SCCF-financed project will build on the tools used by the BES project to develop the capacity of relevant stakeholders with respect to the importance of ecosystems and biodiversity. This would be taken a step further to include the use of ecosystems to adapt to the effects of climate change in the training under Output 1.3. In 2014, the ongoing sub-project communications, outreach and capacity building to support biodiversity and ecosystem services (US\$300,000) developed a website, social media channels and online surveys. In addition, a knowledge and dissemination strategy was developed with support from the IDB's Knowledge and Learning Sector (KNL). The SCCF-financed project will i) build on the capacity and raised awareness under these sub-projects – including the website – through the training provided under Output 1.3; and ii) take lessons learned from using social media and the developed knowledge and dissemination strategy to raise awareness on climate change and the use of EbA under Output 3.2.

193. Under objective 2, the SCCF-financed project will build on the database that has been developed by the BES on regional priority ecosystems. In using this database, EbA will be promoted as an effective approach to enhancing ecosystems services that contribute to the development of economic sectors in an urban and peri-urban context. Additionally, government stakeholders that are involved in the BES programme will be trained on planning and implementing EbA under Outputs 1.2 and 1.3 of the SCCF-financed project. Under Output 2.4 of the project, drought and fire-resistant trees that have deep root systems – thereby binding soils and preventing erosion – will be planted to restore forests in the watersheds surrounding Kingston. These EbA interventions will improve the functioning of ecosystems at the watershed scale, thereby complementing interventions in coastal areas – such as the ecosystem-based ICZM in the Caribbean – to restore mangroves as a buffer against natural disasters.

194. The policy revisions that will be developed within the SCCF-financed project under Output 1.1 will build on the assessments undertaken by the BES programme on the effect of biodiversity policies in the LAC region (US\$350,000). Under the SCCF-financed project, information on urban EbA will be disseminated to the general public through the Caribbean Coastal Capital Centre of Excellence (US\$190,000) and the Integrated Economic-Environmental Framework (US\$300,000), developed through the BES programme.

195. Under objective 4, the SCCF-financed project will build on the following sub –projects of the BES programme: i) developing opportunities for private sector investment in biodiversity and ecosystems (US\$250,000); and ii) expanding private sector investment in biodiversity and ecosystem services (US\$359,000). Through Output 1.3 and 1.4, the SCCF-financed project will build on and consult stakeholders involved in the BES programme of objective 4 of this programme to develop and expand opportunities for private sector investment in conserving and restoring ecosystems in the LAC region.

196. The campaign “**Making Cities Resilient: My City is Getting Ready**” of the United Nations Office for Disaster Risk Reduction (UNISDR). The first phase of this campaign (2010–2011) focused primarily on raising awareness of governments around the necessity of building resilient cities to climate-related hazards and any other risks. The second phase (2012–2015) is ongoing and shifts the focus from awareness raising to implementation. The SCCF project will benefit from this campaign, particularly from the toolkits that UNISDR has already designed to promote resilient cities. In addition, there is interest from UNISDR regional office to create synergies with the SCCF-project and there is already good collaboration with the current regional director¹⁴⁷.

197. The second phase of the **Emergent and Sustainable Cities Initiative (ESCI)** runs from 2014 to 2017 and is funded by the Inter-American Development Bank (IADB). The initiative is helping medium-sized cities in Latin America and the Caribbean to prioritise infrastructure investment and find specific solutions to problems identified using a participatory methodology. The initiative focuses on three pillars: i) environmental sustainability and climate change; ii) integrated urban development; and iii) fiscal sustainability and governance. Since 2013, Xalapa is one of the cities under this initiative. Therefore, the SCCF-financed project will make use of the following parts developed by the ESCI: i) the risk assessments and maps to assess the cities’ vulnerability to natural hazards

¹⁴⁷ Personal communication Mr. Jacinto Buenfil. 29 April 2015.

in the context of climate change; ii) the growth scenarios that are analysed to anticipate Xalapas infrastructure costs; and iii) the information that is collected from different sectors on climate change. The plan for Xalapa also has described potential urban EbA measures. So far the plan has not acquired any funding yet and therefore is a good reference to request additional funds for pilot initiatives developed in the SCCF-financed project¹⁴⁸.

198. **ICLEI - Local Governments for Sustainability** is a global network of cities and local governments dedicated to sustainable development, including Latin America and the Caribbean. ICLEI provides technical assistance, training and information services to build capacity and share knowledge as well as support the implementation of sustainable development at the local level. ICLEI works in San Salvador, El Salvador and Veracruz, Mexico. Recently, ICLEI developed the municipal climate action plan for Xalapa, which has not been carried out yet. The SCCF-financed project will take lessons learned from ICLEI to improve linkages with the technical staff of local governments. This will include building capacity of technical government staff and promote the inclusion of EbA interventions into sustainable development plans and policies of the local government in San Salvador and Xalapa.

199. **The UN-HABITAT Cities and Climate Change Initiative (CCCI)** is a global project that targets medium-sized cities in developing countries. It focuses on good governance and practical initiatives for municipalities and their citizens to address climate change. The initiative began in 2008 and has a budget of US\$ 8 million.

200. The GEF-funded project **Climate Technology Transfer Mechanisms and Networks in Latin America and the Caribbean (2015–2018)**¹⁴⁹ will be implemented by the Inter-American Development Bank. The project will pilot institutional frameworks and mechanisms for the development and transfer of environmentally sound technologies (EST) in the energy (renewable energy and energy efficiency), transport and forestry sectors, to leverage investments from the public and private sectors. The development and transfer of ESTs in the LAC region will contribute to the reduction of greenhouse gas (GHG) emissions and reducing the vulnerability to climate change in specific sectors. The SCCF-financed project will align specifically with the Outcome 1.1 “Development of national capacities to identify, prioritize and promote climate technologies” and Outcome 2.2 “Thematic network on the development and transfer of adaptation technologies for agriculture created/strengthened” of the IADB project to integrate urban EbA in both Outcomes.

201. **The GEF Earth Fund: Public-Private Funding Mechanisms for Watershed Protection project** is currently implemented by The Nature Conservancy. The objective of this project is to set up public-private funding mechanisms to promote private sector participation in the conservation of freshwater ecosystems and biodiversity of global importance. The project is particularly interesting as it focuses on the watersheds around large cities in the LAC region. Therefore, the SCCF-financed project will take lessons learned of the financial and institutional mechanisms implemented under the GEF Earth Fund project to implement urban EbA interventions at the watershed level.

¹⁴⁸ The project is quite relevant for Xalapa. The person UNEP-ROLAC has contacted is Ricardo De Vecchi who leads the possible implementation of ESCI projects, particularly in Mexico. ricardod@IADB.ORG.

¹⁴⁹ The project document for this project, including management arrangements is available on: <http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=38697709>

202. The **Waterclima LAC project** (2014–2018) is funded with €7 million by the European Commission. The project aims to improve the dialogue and cooperation on watershed and coastal management in the context of climate change by supporting technical and financial mechanisms. The emphasis will be on capacity building for policy-makers and public institutions and will include financial management, transparency and accountability of public expenditure and decision-making. In addition, the enhanced development of capacities in the water sector in the LAC region and the implementation of pilot projects is expected to contribute to a better governance and sustainable management of water resources and increased cooperation. The SCCF-financed project will therefore collaborate closely with this project to: i) complement the (urban) EbA aspect in adapting to climate change in the water sector; and ii) take lessons learned and build on the capacity developed through the Waterclima project. The main beneficiaries of this project are government bodies and institutions responsible for water and coastal management and research institutions and private sector that participate in research and training.

National level

El Salvador

203. The **LGGE: Energy Efficiency in Public Buildings (EPPB)** project is funded by the GEF Trust Fund and implemented by the Ministry of Environment and Natural Resources (MARN) in close cooperation with the Ministry of Education (MINED) and the Ministry of Economy (MINEC). The objective is to introduce energy efficiency (EE) measures in existing and new public buildings by creating a conducive policy environment, increasing user awareness, developing performance criteria and standards, and implementing a broad EE pilot within selected public entities. The SCCF-financed project will build forward on the technical and institutional capacity that has been developed under component 1 – policy – of the project. In addition, it will collate the lessons learned under component 4 – monitoring and evaluation – to consider these when implementing the adaptation interventions and revising relevant policies and plans.

204. **The REDD+ Readiness El Salvador project** is implemented by the MARN, in close cooperation with the MAG. The World Bank is funding the project with US\$3.6 million. The project takes an adaptation approach through large-scale landscape restoration to recover the ecosystem services. In addition, the project contributes to climate change mitigation by increasing the sequestration and storage of carbon. The REDD+ project has the strategy to: i) harmonize policies and associated sectoral laws or laws that have an influence on the use of soil; ii) enable and apply legal instruments related to the zoning and land use, the regulation of agricultural practices, control of land use change, illegal logging, firewood extraction and control of forest fires; iii) design and implement a program of incentives and compensation mechanisms; iv) have adequate legal instruments to recognize the rights to natural resources and forest management; and v) promote conservation strategies for forest ecosystems and restoration of their ecological connectivity. The SCCF-financed project will contribute to the REDD+ project through Component one regarding the technical and institutional capacity. In addition, the SCCF-financed project will collect the lessons learned and will consider these in Component 1 and Component 2.

205. **The Third National Communication and Climate Change Biennial Report** is a US\$852,000 funded GEF/UNDP project and will be executed in the period 2015–2017. Under Component 1, the SCCF-financed project will collaborate closely with this project build

on the climate change adaptation activities mention in this TNC and complement these activities using EbA as a tool to adapt to the effects of climate change.

206. The International Development Bank (IDB) is funding a project worth US\$480,000 on “**Support to the Climate Change Strategy**” and will be executed in the period 2014–2015. The SCCF-financed will complement the adaptation activities under this Climate Change Strategy by implementing EbA interventions particular urban EbA.

207. **The Program for the Restoration of the Ecosystems and Landscape of El Salvador (PREP)** is funded by the Global Environment Fund with a budget of ~US\$1,5 million. The program is designed by the MARN with the aim to promote and facilitate the restoration of the ecosystems and landscape. This will be achieved through including environmental services and conservation of biodiversity as part of a strategy to adapt to the effects and variability of climate change. The PREP programme is the main tool for adaptation to climate change and forms part of the new National Policy of Environment and Natural Resources, launched in May 2012. This programme has an EbA component, but focuses on rural areas. The SCCF-financed project will therefore collect the lessons learned and take these into account under the Outputs and activities under Outcomes 1 and 2 to implement urban EbA.

208. **The Landscape Restoration project** South of Ahuachapan is implemented by the MARN and funded with €2 million by the German Cooperation. The SCCF-financed project will collect lessons learned on landscape and ecosystem restoration and include these in the training workshops of Component 1 and Component 2. The project will end in 2016.

209. **The “Strategies for Sustainable Urban Development: Associate Planning and Participative Management of the Territory by SIG- P”** project is funded by the European Commission. This project finished in February 2015 and was implemented by the Italian NGO Medina together with the Mayor of San Salvador and the Planning Office of Metropolitan Area of San Salvador. The project developed a participatory model of standard procedures to territorial information management and made a pilot project of Participatory Geographic Information System. The outputs of the projects were i) built and empowered exchange network between local actors through a model of participatory urban planning and management; ii) strengthened technical and management capacities of partner institutions and empowered communities; iii) improved comprehensive land management and public services through the implementation and deployment of a multilevel participatory geographic information system. Under Component 1 and 3, the SCCF-financed project will build on the developed capacity of the institution and urban communities to integrate EbA into the urban development plans. In addition, for the scenario maps developed under Output 2.1, the SCCF-financed project will build on the GIS systems/maps to assist in local level zoning and planning.

210. **The DIPECHO VIII project: “Capacity building and sustainable strategies for risk reduction, preparedness and adaptation in the metropolitan area of San Salvador in institutional and community levels”** (2014–2015). The project was implemented by OXFAM and PROCOMES. The objectives of this project are i) improving the capacity of local institutions to deal with disasters; ii) building on previous DIPECHO actions and other projects; iii) expanding the coverage of the disaster risk reduction and preparedness of actions in the AMSS; and iv) ensuring timely and sustainable management for local authorities of different components of the disaster risk reduction. The SCCF-financed project will collect lessons learned and build on the developed capacity of local institutions under

Component 1. In addition, it will adopt the systems developed to respond to natural disasters to increase adaptation to climate change.

211. The project **Food Program and School Health**, is executed and funded by the Ministry of Education (MINED). In 2008, MINED and the FAO signed an agreement to develop the project: "Support for curriculum development in basic education to improve nutrition education and food security", through developing school gardens with technical and financial assistance of the FAO. Currently, this curriculum is institutionalised by the MINED for \$600,000 per year. The school garden has three objectives: i) be productive and environmentally friendly; ii) be educational; and iii) provide food and nutrition security. The SCCF-financed project will collect lessons learned to develop the urban gardens in Output 2.3.

212. The Ministry of Agriculture (MAG) is implementing the programme "**Urban and peri-urban Agriculture**", which started September 2014. The program has the objective to: i) contributing to the food security of the poorest families in urban and peri-urban municipalities of different areas of the country; ii) the consumption and commercialization of surpluses; iii) improving diet; and iv) providing technical training. The SCCF-financed project will collect lessons learned in component 2 and will work with in coordination with this project for the promotion of sustainable agriculture to the peri-urban communities in the watershed and the development of the urban gardens at the schools.

213. The "**SLV-056-B Integrated Project of water, sanitation and environment**" project is funded by the Fund of Cooperation for Water and Sanitation (FCAS) for a total of \$13.9 million dollars by FCAS and \$3.41 million dollars by the GOES as well as a multilateral national program administered by the BID for US\$3.41 million. The program has a duration of five years and finishes in 2017. Its overall objective is to contribute increasing the coverage, quality and sustainability of water and sanitation services, as well as strengthening the comprehensive management of water resources in the water and sanitation subsector. The products of the programme are:

- The national plan of comprehensive management of water resources and the plans of action in priority basins;
- The general water law;
- The policy and national strategy of water resources; and
- An information system to improve the knowledge to regulate the use and management of the water resources.

The programme has an intervention to recover the basin of Acelhuate, – which includes the sub basin Arenal-Monserrat – hence the SCCF-financed project will align strongly with the FCAS program. The SCCF-financed project will collect lessons learned build on the interventions by the FCAS project, particularly for the development of the watershed strategy under Outcome 1 of the SCCF-financed project.

214. The **Montreal Urban Park project** is created with the support of Cordaid, the Project Montreal Urban Park focuses on violence prevention in an environmentally and socially vulnerable area in the north-east sector of the Municipality of Mejicanos in the North of the San Salvador Metropolitan Area. The Project is implemented in partnership with the Municipality of Mejicanos. The land is located in the geographical centre of the "head" or the beginning of the watershed of the seven springs, which integrates a hydrographic basin system. The Montreal Urban Park initiative, initiated at the request of local communities, has resulted in the need to tackle the problems of the area, and the formulation of an urban

program entitled "Building Inclusive Neighbourhoods", which is comprised of five components:

1. Citizen Security and Coexistence.
2. Integral Neighbourhood Improvement.
3. Job Placement of Youths and Women at Risk: Employability and Entrepreneurship.
4. Environmental Management and Urban Agriculture.
5. Governance.

215. Under component 4, environmental management focuses on the development of the so-called "Urban Farm", to be implemented in the western sector of the land. The area will serve as a training and demonstration centre for organic farming. Urban agriculture includes aspects of education in agriculture such as training of urban farmers to increase their yield and add value to their produce. The SCCF-financed project will collect the lessons learned on the training and urban farming under Outcome 2 of the SCCF-financed project.

Jamaica

216. The GEF-UNEP funded project **LGGE Promoting Energy Efficiency and Renewable Energy in Buildings in Jamaica** is a forty eight (48) months US \$7,000,000.00 project executed by the University of the West Indies in cooperation with national public and private sector organisations and with technical and advisory support from the centre of excellence for renewable energy. The project has five components, including *inter alia* monitoring and evaluation and dissemination.

217. GEF Trust Fund **Integrated Management of the Yallahs River and Hope River Watersheds (2014–2018)** is being executed by the NEPA and a number of related entities. Such as the Office of the Prime Minister (Lead), PIOJ, Forestry Department (FD), water Resources Authority (WRA), National Irrigation Commission (NIC), Ministry of Agriculture and Fisheries (MOAF) & Rural Agriculture Development Authority (RADA). The objective of the project is to improve the conservation and management of biodiversity and the provision of ecosystem services in the Yallahs River and Hope River watersheds. The budget of the project is US\$12,933,198. The SCCF-financed project will take lessons learned from the management of the Hope River watershed that supplies water to the KMA and promote the integration of EbA to improve the management of the two watersheds.

218. The **National Biodiversity Planning to Support the Implementation of the CBD Strategic Plan in Jamaica** (2014–2015) is funded by the GEF-UNDP with US\$220,000 and being implemented by the NEPA. The objective is to integrate Jamaica's obligation under the CBD into its national development and sectoral planning framework through a renewed and participative "biodiversity planning" and strategizing process. The SCCF-financed project will take into account the biodiversity objectives when implementing the adaptation activities.

219. The US\$18,295,970 funded **Pilot Program for Climate Resilience (PPCR- Phase II)** (2014–2018) is being implemented by the MWLECC with coordination by the Planning Institute of Jamaica (PIOJ) to generate information on approaches to address climate challenges, help mainstream climate change into development planning and processes and disseminate results across sectors. Under Component 1, the SCCF-financed project will build on the efforts to mainstream climate change into development planning processes across sectors. The project will therefore collaborate with the PPCR project to take lessons learned and avoid duplication of efforts.

220. **The Artificial Groundwater Recharge System** project (2014–2016) is funded with US\$8,928,571 and forms part of the NWA attempts at managing the island's water resources to achieve the NWC's Vision 2030 Jamaica - National Development plan goals. The implementing institutions are SM and M Jamaica Limited and the Rural Water Supply Limited. The project has three objectives: i) increase the revenue from additional water availability; ii) the sustainable abstraction of ~3.5 million gallons per day from nearby wells; and iii) the alleviation of water shortages and restrictions during the dry season. The SCCF-financed project will align with this project under Component 2 when designing appropriate urban EbA interventions to address the flooding and occurrence of drought.

221. The **Jamaica Rural Economy and Ecosystems Adapting to Climate Change (JA REEACH)** will be implemented by the MWLECC and the Ministry of Science Technology, Energy and Mining (MSTEM) from 2012 to 2015 and is funded with US\$9,234,717 by the U.S. Government. The objective is to i) promote rural livelihoods and natural systems that are resilient to the impacts of climate change; and ii) strengthen the capacity of local and national institutions to support the processes of adaptation and sustainability. Under Component 2, the SCCF-financed project will build on the developed capacity to promote climate-resilient livelihoods and under Component 1, the project will build on the developed capacity of local and national institutions to support the process to adapt to climate change.

222. The **Food Facility project** (2014–2018) is funded by the European Commission and FAO with US\$5,800,000 to support poverty reduction and food security of vulnerable groups, and improved availability of safe, affordable and nutritious food for the rural and urban poor. The project supports the food security strategy of the government of Jamaica by promoting sustainable increases in productivity of Jamaican agriculture and import substitution policies. Fourteen strategic areas have been identified of which the following include climate change: i) Establish four greenhouses to provide quality seedlings to vegetable producers; and ii) increase the use of small scale irrigation by providing seven selected producer groups with irrigation systems operated through water users groups. Under Component 2, the SCCF-financed project will take lessons learned and adopt best practices for developing urban agricultural activities to address the food insecurity of local communities.

223. **The COMET 11** (2013–2018) is a US\$12,707,527 project funded by USAID. The objective is to strengthen community and civil society organizations (CSOs), increase citizen cooperation and accountability, strengthen juvenile justice and youth at-risk programs and further support community-based policing practices. The project has four components: i) community driven safety and security empowerment; ii) establishing supportive of a culture of lawfulness; iii) alternative programs for youth at risk; and iv) community policing. Climate change is a cross cutting theme with the objective to enhance the adaptive capacity of selected communities to respond to the negative impacts of climate change. The SCCF-financed project will build on the community work undertaken by this project – in particular under Component 2 and 3 – to take lessons learned how best to approach the communities and develop the awareness campaign on climate change. In addition, the COMET project can provide a useful link in getting communities to take part in the EbA interventions, for example to monitor the implemented EbA interventions.

224. **The “Management of coastal resources and conservation of marine biodiversity in the Caribbean” (2012–2015)** is project funded by BMZ-GIZ. The SCCF-financed project will use lessons learned to form partnerships with the private sector in the development of the EbA interventions to secure their continuity and sustainability after the project's lifespan. In Jamaica the SCCF-financed project will build on the interventions of the BMZ-GIZ project

that contributed to the development of environmentally-friendly sewage disposal to enhance ecosystem functioning.

Mexico

225. **The Watersheds and Cities Program** (2014–2017) includes a project in the Pixquiac river basin whose ecosystem services, including the provision of water, are very important for Xalapa. It is a US\$1.1 million project, funded by the Gonzalo Río Arronte Foundation and the Mexican Fund for the Conservation of Nature (FMCN) (together accounting for 21% of the budget), the National Commission for Natural Protected Areas CONANP), the National Forestry Commission (CONAFOR), the Natural Protected Areas Commission (CONANP), the State of Veracruz, the Water and Sanitation Committee-Xalapa (CMAS), the Cofre de Perote Park, Conaculta and Fomento Social Banamex. The implementing agency is *Senderos y Encuentros para un Desarrollo Autónomo Sustentable, A.C. (Sendas)*, a local NGO. The main objective of this project is to sustain and recover natural processes through planning, protection and environmental restoration of natural resources in the Pixquiac river basin to improve living conditions for local population, and benefit rural and urban water users. The SCCF-financed project will acquire progress reports of this program and consult the project managers to take lessons learned from this project as the projects are at similar scale and scope. Furthermore, Sendas has played a relevant role in the design of the EbA interventions for the SCCF-financed project.

226. The project **“Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change” (2013–2018)** is funded by the GEF-UNDP with US\$ 10,972,727 and executed by CONANP. The main objective of the project is to transform management and coverage of terrestrial and coastal protected areas in Mexico to alleviate the direct and indirect impacts of climate change. This will be achieved through three components: i) developing management systems¹⁵⁰ – for monitoring and early warning systems, management decision making tools and sustainable financing – to optimise national readiness to address future climate change effects on NPAs; ii) expanding NPAs in landscapes sensitive to climate change to protect refugia and corridors; and iii) building readiness to address specific climate change impacts in vulnerable PAs through ecoregion-specific interventions in 17 priority NPAs.

227. The GEF project **Conservation of coastal watersheds to achieve multiple global environmental benefits in context of changing environments** is supported by the World Bank and executed by the CONANP, the CONAFOR, FMCN and the National Institute of Ecology and Climate Change (INECC). The total budget for the project is US\$267,7 million, of which US\$39,5 million is granted by the GEF. The main objectives of this project are to promote integrated environmental management of selected coastal watersheds as a means to conserve biodiversity, contribute to climate change mitigation, and enhance sustainable land use. The project focuses on the coastal watersheds near the Gulf of Mexico, which will include the implementation area of the SCCF-project.

228. The GEF-World Bank project **Adaptation to Climate Change Impacts on the Coastal Wetlands in the Gulf of Mexico through Improved Water Resource Management (2009–2014)** was a US\$ 5,280,000 funded project executed by SEMARNAT and local agencies. The main objective was to reduce vulnerability to the anticipated impacts

150

from climate change on the country's water resources, with a primary focus on coastal wetlands and associated inland basins. This would be achieved through three components: i) national policies to address the impacts of climate change on water resources management; ii) detailed design of key selected adaptation measures; and iii) implementation of pilot adaptation measures in selected wetlands highly vulnerable to the effects of climate change. This project is particularly relevant to the SCCF project as it addressed the management of water resources, including wetlands and urban water infrastructure. The SCCF-financed project will build on the activities implemented under this project to take lessons learned and prevent duplication of efforts. These activities include *inter alia* the: i) collected data on adaptation measures; ii) developed monitoring system; iii) installed Early Warning System; and iv) implemented rainwater harvesting measures.

229. The GEF-funded project **Enhancing Mexico's Environmental Sustainability in Regional Hubs (2016 – 2021)** is a US\$13,761,468 funded project and will be implemented by the Inter-American Development Bank, as part of the GEF's Sustainable Cities Integrated Approach Pilot program. The proposed project entails enhancing Mexico's environmental sustainability through the development of projects and policies in cities that: i) serve as regional hubs; and ii) are located in environmentally important areas for the country. The objective is to promote the development of sustainable policies and projects in medium-sized cities, by supporting environmental and urban sustainability in cities that can serve as examples for the rest of the country. As one of the three selected cities is Xalapa, the SCCF-financed Urban EbA LAC project will complement the climate change mitigation aspects of this project with climate change adaptation elements. Particular components of the IADB project on which the SCCF-financed project will build on include: i) Component 1 regarding integrated sustainable urban planning and management; ii) Component 3 on catalysing investments for sustainable cities – the SCCF project will take lessons learned for developing the sustainable finance strategy under Output 1.4; and iii) Component 4 to enhance partnerships for sustainable cities at local, national, and global levels (through knowledge management, capacity building, global coordination) – which will also be done through Output 3.5 of the SCCF-financed project.

SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)

3.1. Project rationale, policy conformity and expected global environmental benefits

230. Rapid urbanisation, ineffective implementation of urban development plans, poverty and unsustainable use of resources in medium-sized cities in the LAC region has led to the degradation of urban and peri-urban ecosystems and a decline in the provision of ecosystem services. The effects of such ecosystem degradation include: i) reduced water infiltration by removal of vegetation and catchment hardening which leads to reduced groundwater availability and increased flooding; ii) increased soil erosion as a result of reduced forest and wetlands through urban expansion; and iii) decreased water quality as a result of increasing pollution in rivers and other water ways. These effects threaten the lives and well-being of urban communities, thereby reducing food and water security. Ecosystem degradation and the consequent threats to the well-being of urban communities in the LAC region will be exacerbated by the negative effects of climate change. Climate change models for this region predict an increase in mean annual temperature and rainfall variability, which will result in an increased frequency and intensity of floods and droughts. Poor communities in these medium-sized cities are particularly vulnerable to climate change variability because they rely strongly on ecosystem services for their well-being.

231. EbA provides a cost-effective way to reduce climate change vulnerability of urban and peri-urban communities while providing multiple co-benefits to these communities and the environment, by protecting, maintaining and rehabilitating ecosystems¹⁵¹. Importantly, EbA has been shown to require comparatively small investments relative to the long-term social, economic and environmental benefits¹⁵². EbA interventions implemented by the project will therefore provide multiple benefits to poor urban communities in San Salvador, Kingston and Xalapa. Household-level interventions – such as improved rainwater harvesting and water recycling systems – will increase the water supply and reduce the negative effects of droughts. Urban reforestation and urban agriculture will increase vegetative cover within a city, thereby reducing heat stress, air pollution and the associated public health risks. Furthermore, the additional water storage capacity of wetlands will increase water infiltration. Consequently, the adverse effects of storm water runoff – such as flooding – will be reduced. Restored wetlands and streams in urban areas will also aid in the maintenance of water quality and availability. It has been noted that compared with degraded wetlands, healthy wetlands and rivers may support a greater abundance of fish, which can be sustainably harvested to improve food security for vulnerable urban communities. The urban EbA interventions including inter alia wetland rehabilitation and the creation of detention basins will therefore provide benefits – such as increased water infiltration and consequently reduced flooding – to several economic sectors, including water, infrastructure and health.

232. In the last five years, local and national governments in El Salvador, Jamaica and Mexico have started to develop plans and strategies – such as national and local climate change strategies – to address the effects of climate change. In addition, climate change has increasingly been incorporated into the policies and plans of multiple economic sectors such as urban planning, water, agriculture, energy and transport (see Sections 2.4 and 3.6). However, there is still limited awareness and adoption of EbA by urban communities. This is attributed to limitations in: i) the knowledge and institutional capacity within government in these countries to integrate urban EbA into relevant policies, plans and strategies; ii) cross-sectoral coordination between and within government departments, the private sector and research institutions to exchange information on existing interventions to adapt to climate change; iii) awareness among urban communities on climate change and potential options to reduce the negative effects on their livelihoods; and iv) monitoring and communication on the benefits and lessons learned from the existing EbA interventions in LAC cities¹⁵³.

233. The SCCF-financed project will contribute to increasing the capacity of the local government and urban communities in three pilot cities in the LAC region: San Salvador, Kingston and Xalapa. This objective will be achieved by: i) strengthening the institutional and technical capacity of local government to plan and implement urban EbA; ii) building on revisions to national policies and plans undertaken by other projects to integrate urban EbA; and iii) implementing urban EbA interventions to reduce the vulnerability of poor urban communities to future climate change. Details of the interventions are described in Section 3.3.

234. The SCCF-financed project will also generate benefits for the pilot cities and the region long after the implementation period. This will be enabled by: i) applying an upscaling

¹⁵¹ Jones, H.P., Hole, D.G. & Zavaleta, E.S. 2012. Harnessing nature to help people adapt to climate change. *Nature Climate Change* 2: 504–509.

¹⁵² UNEP/STREP 2012. A comparative analysis of ecosystem-based adaptation and engineering options for Lami Town, Fiji: Synthesis Report.

¹⁵³ Examples of urban EbA interventions exist in Aguascalientes, Mexico and Curitiba, Brazil.

strategy to collate and disseminate lessons learned on urban EbA to other cities within the LAC region; ii) integrating the EbA approach into existing climate change departments at universities; and iii) communicating the results of the Long-term Research Programme (LTRP) under Output 3.3 to national and regional networks. In addition, this information will be shared with the national and regional committees. As a result, the national and regional capacity to plan, implement and upscale urban EbA in other cities across the LAC region will be increased.

Policy conformity

235. The SCCF-financed project is aligned with the GEF Focal Area/LDCF/SCCF strategies. In particular, the following “Focal Area Objectives” are addressed by the project:

CCA-1, Outcome 1.1 Vulnerability of physical assets and natural systems reduced. Urban EbA interventions under Component 2 will: i) reduce runoff and enhance infiltration of rainfall at watershed scale by constructing vegetated infiltration ditches (San Salvador and Xalapa), restoring vegetation (San Salvador, Kingston and Xalapa); ii) contribute to enhanced water storage capacity through wetland rehabilitation (Kingston), the creation of natural storage points for excess water (San Salvador and Xalapa); iii) increase water quality and availability at household level for washing and irrigation of gardens by implementing a solid waste management system (San Salvador and Jamaica) and; iv) rainwater harvesting schemes (San Salvador, Kingston and Xalapa). As a result of these activities, urban communities will be less vulnerable to: i) flooding as a result of increased rainfall; and ii) water shortages as a result of more frequent and prolonged droughts. In addition, training on climate-resilient livelihoods and the use of protocols to implement and maintain the EbA interventions will reduce the vulnerability of the urban communities to the effects of climate change.

CCA-2, Outcome 2.1: Increased awareness of climate change impacts, vulnerability and adaptation. Under Component 3 of the project, awareness raising campaigns will be held in San Salvador, Kingston and Xalapa using tailored communication tools to increase the awareness of the urban communities on climate change and the benefits of EbA to adapt to the effects of climate change. In addition, under Output 3.3, a long-term research programme will be established within national research institutions to monitor the benefits of the implemented urban EbA interventions. These research institutions include the University of El Salvador (San Salvador), the University of the West Indies (Kingston) and the Institute of Ecology (Xalapa). The results of this research will be shared with project stakeholders and the general public through peer-reviewed papers to improve the scientific and technical knowledge on urban EbA across the LAC region. In addition, educational toolkits will be developed for primary and secondary schools in San Salvador, Kingston and Xalapa to increase their awareness on the effects of climate change and EbA.

CCA-3, Outcome 2.3 Institutional and technical capacities and human skills strengthened to identify, prioritize, implement, monitor and evaluate adaptation strategies and measures. Under Component 1, the SCCF-financed project will propose revisions to the relevant national and sub-national environmental plans and strategies to incorporate urban EbA. In addition, a framework to share technical information on urban EbA will be established to promote communication between the stakeholders. Using this framework, a roadmap for medium- and long-term urban development of the municipality will be established to identify and implement urban EbA. Furthermore, an upscaling strategy will be developed to extend the revised plans, strategies and lessons learned to other cities in the LAC region.

236. The SCCF-financed project is aligned with the national policies, strategies and plans that focus on climate change adaptation and environmental management. These include in

particular: El Salvador's National Climate Change Plan (2014–2019), Jamaica's National Environmental Action Plan (JaNEAP) and Mexico's National Climate Change Strategy (2013).

SCCF conformity

237. The SCCF-financed project conforms to the SCCF's eligibility criteria, namely: i) undertaking a country-driven, participatory and cost-effective approach; ii) taking into account national communications and other relevant documents; iii) supporting a learning-by-doing approach; iv) leveraging additional resources; v) undertaking a multidisciplinary and complementary approach; and vi) promoting gender equality.

238. **Country driven, participatory and cost-effective approach:** Activities to be undertaken by the SCCF-financed project were selected through numerous stakeholder consultations and are therefore in line with country priorities. Further details on conformity with national priorities are provided in Section 3.6. The project will build on existing regional networks and national projects in the three pilot countries. This is a cost-effective approach to institutional capacity building, which will facilitate the planning and implementation of urban EbA. See Section 7.3 for more detailed information of the cost-effective approach of EbA.

239. **Country specific recommendations (National Communications and TNAs):** The SCCF-financed project will address the adverse effects of climate change and support the transfer of climate-resilient technologies among developing countries and regions. This will take place in alignment with the recommendations from national communications, TNAs and other relevant country specific information.

240. **Learning-by-doing approach:** The on-the-ground interventions of the SCCF-financed project will be tailored to the needs of poor urban communities using a learning-by-doing approach. Additionally, lessons learned from the pilot interventions of the project will be collected and disseminated to inform local and national urban development plans in the country and elsewhere in the LAC region.

241. **Leveraging additional resources:** The SCCF-financed project will build on one regional baseline project and three national baseline projects that are providing co-financing to the project. For example, the project will build forth on their activities, use their developed frameworks and documents and take lessons learned to avoid duplication of efforts.

242. **Multi-disciplinary and complementary approach:** The project's interventions require the involvement of different economic sectors including water, infrastructure and health. Therefore, a multidisciplinary approach was adopted in the development of the interventions, which included consultations with stakeholders from several sectors. The same approach will be undertaken during the design and implementation of the urban EbA interventions under Output 2.3. In addition, the project will work in conjunction with relevant ongoing projects that include climate change adaptation (see Section 2.7). The project will complement the activities of these ongoing projects by including urban EbA and building on lessons learned to avoid duplication of efforts. A particular focus will be given to sharing information on urban EbA with other adaptation projects to promote the use of this approach.

243. **Gender equality:** In the past two decades, women have become increasingly prominent in politics and economic activity within the LAC region¹⁵⁴. For example, representation of women in parliament in several countries in the LAC region¹⁵⁵ is ~30%. This percentage exceeds that of the USA and Canada, with ~18% and ~25%, respectively¹⁵⁶. Furthermore, the percentage of women in higher education (~53%) in the LAC region now exceeds that of men (~47%), and women have a higher life expectancy than men. Despite this improved access to education and life expectancy across the LAC region, social and cultural norms at the household, community, and national levels still result in disadvantages for women, including: i) wage discrimination; ii) occupational segregation; iii) exclusion from decision-making¹⁵⁷; and iv) limited access to financial opportunities as a result of full-time obligations related to caring for families. Additional challenges to gender equality in the LAC region include high rates of adolescent pregnancy and gender-based violence. This is particularly notable among women with limited access to higher education and the labour market. As a result, women's access to financial resources within the LAC region remains limited resulting in considerably greater vulnerability to the effects of climate change compared with men.

El Salvador

244. In recent years, El Salvador has moved towards gender equity and equality by adopting regulations regarding the rights of women, including: i) the Comprehensive Law for a Life Free of Violence for Women (2010); ii) the Law of Equity and Equality and Elimination of Discrimination against Women (2011); iii) the National Policy on Women (2011); iv) the National Plan for Equality and Equity for Salvadoran Women (2012); and v) Institutional Guidelines for Substantive Equality (2013). In addition, in 2010, the mayor of San Salvador approved the municipal policy for gender equality.

245. In El Salvador, the national literacy rate for women is ~14%¹⁵⁸. The school attendance rate of women nationally and in the AMSS is ~30%, while that of men is ~35%¹⁵⁹. In addition, the average salary of a woman in El Salvador is ~15 % less than a man¹⁶⁰. In 2012, the Gender Equity Index (GEI)¹⁶¹ for El Salvador indicated a total score of 62 – on a scale in which 100 represents complete equality – which is among the lowest scores in Latin America and the Caribbean¹⁶².

246. The SCCF-financed project will give priority to women when implementing the EbA interventions, in particular at schools. Activities will include identifying tools to select climate-resilient crops and exploring opportunities to commercialise these crops when produced at a larger scale. By involving women in the commercialisation of crops, the project activities will

¹⁵⁴ Alves, J.E.D., et al. 2013. Population and changes in gender inequalities in Latin America. National School of Science – ENCE/IBGE.

¹⁵⁵ These countries include Cuba, Nicaragua, Costa Rica, Argentina, Mexico, Grenada, Ecuador and Guyana.

¹⁵⁶ Alves, J.E.D., et al. 2013. Population and changes in gender inequalities in Latin America. National School of Science – ENCE/IBGE.

¹⁵⁷ <http://www.worldbank.org/en/events/2014/11/24/gender-equality-lac>. Accessed on 20 March 2015.

¹⁵⁸ Encuesta de hogares. 2013. Available at: <http://www.digestyc.gob.sv/EHPM2013/digestyc/resultado.pdf> Accessed on 30 April 2015.

¹⁵⁹ Encuesta de hogares. 2013. Available at: <http://www.digestyc.gob.sv/EHPM2013/digestyc/resultado.pdf> Accessed on 30 April 2015.

¹⁶⁰ Encuesta de hogares multiples. 2010.

¹⁶¹ This index measures the gap between men and women in education, economic participation and political empowerment.

¹⁶² <http://www.socialwatch.org/es/node/14383>. Accessed on 4 May 2015.

generate additional income for women. This will enhance their livelihoods and enable them to improve their socio-economic conditions, for example by investing in education or healthcare for themselves and their families. In addition, including female students in the implementation of rainwater harvesting systems will increase women's capacity to maintain – and benefit from – these systems after the project implementation period. Regarding the training of government authorities, emphasis will be placed on increasing the technical capacity of women to identify, prioritise, plan and implement urban EbA interventions. This prioritisation of women is aligned with the recently developed regulations regarding the rights of women as described in paragraph 243.

Jamaica

247. The National Policy for Gender Equality (NPGE) 2011 provides a comprehensive framework for the Government of Jamaica's (GOJ) national development to promote gender equality and woman empowerment. The policy incorporates all of the principles affirmed by the country through international and regional agreements and offers a road map for future legislation to include gender equality as a national value and constitutive element. Despite this policy, many gender inequalities continue to exist because of culture and socially learned attitudes. This is for example evidenced by: i) high levels of gender-based violence/sexual violence; and ii) unequal representation of women in top public and political positions. Although gender-based violence is widespread, it remains largely un-documented because of the under-reporting of incidents¹⁶³. The prevalence of violence by men can partly be attributed to the limited employment opportunities that exist for men. Given the reduced financial position, these men have tended to become involved in illegal activities that have subsequently lead to their imprisonment or death. As a result, most poor households in the KMA are currently headed by women¹⁶⁴.

248. Besides the existing gender inequality in Jamaica, the participation and performance of women in the labour force and education sector has considerably improved. In 2012, the Jamaican labour force comprised of ~45% females, partly because of migration by women for economic reasons and partly because many women still remain outside the labour force to take care of family¹⁶⁵. In the education sector, more women than men are enrolled, particularly at tertiary institutions¹⁶⁶. As a result, the participation of women in the labour force has increased and consequently their level of economic empowerment.

249. In Kingston, the proposed EbA interventions to develop climate-resilient livelihoods will prioritise women. To achieve this, a community women's group will be established and given responsibility for the development of fruit orchards, vegetable gardens and bee - keeping. To ensure an equal division of revenues of the fruits and vegetables among the group, a benefit-sharing mechanism will be developed. The yields of the additional livelihoods will primarily be for local consumption. Any excess will be sold to go into a fund – as part of the benefit-sharing mechanism under 2.4.1 – to maintain these orchards and for other such projects. Payments from this fund to maintain the orchards will serve as additional income for women, particularly those who are heads of their respective households.

¹⁶³ Mora, L. (2006) cited by Contreras, J.M.; Bott, S; Guedes A.; Dartnall, E. (2010). Violencia sexual en Latinoamerica y el Caribe: analisis de datos secundarios. Iniciative de Investigacion sobre Violencia Sexual

¹⁶⁴ http://pioj.gov.jm/Portals/0/Sustainable_Development/PovertyEnvironmental%20Vulnerability%20Relationship.pdf. Accessed on 20 April 2015.

¹⁶⁵ Planning Institute Of Jamaica (PIOJ). 2013. ESSJ.

¹⁶⁶ <http://jamaica-gleaner.com/gleaner/20120916/cleisure/cleisure4.html>. Accessed on 11 June 2015

Mexico

250. In 2012, three out of ten households in Mexico were headed by women¹⁶⁷ of which ~40% were considered to be living in poverty. There are several factors that contribute making female headed households more vulnerable than those headed by men. Firstly, family structure. Of the nuclear¹⁶⁸ family, ~65% is headed by men compared with ~35% by women. In contrast, extended families are more common in female headed households (~50% against ~30% in homes headed by men), which adds to the number of dependents on women.¹⁶⁹ In 2010, the gender salary gap in Mexico is accentuated by education. In higher education, the salary of women is on average 10% lower than those of men with the same qualifications. However, a woman with lower level education is on average paid ~30% less than a man with the same level of education¹⁷⁰. Currently, up until secondary education girls attend school more than boys, where the rate is inverted. This is, however, reverted again in graduate education, where female enrolment is slightly higher than male¹⁷¹. At the national level, gender equality is fully recognized in the National Strategy on Climate Change and the Special Program on Climate Change.

251. In Xalapa, ~55% of the population is female. Of the ~107,000 households in the municipality, ~30% of them are headed by a woman and half of them are nuclear families¹⁷². The percentage of women participating in the economy is ~45%, which is higher than the State of Veracruz's (~27%) and the National average (~33%)¹⁷³. There is a balanced gender ratio throughout basic and secondary education, but more women than men are enrolled in technical education as well as tertiary education where there are ~10% more female than male students¹⁷⁴.

252. The SCCF-financed project will target poor urban communities, particularly women whose vulnerability will be increased by the predicted effects of climate change. For example, the project will give preference to female headed households and tailor interventions meet the needs of women to increase their well-being. Targets for involving women are included in the Results Framework of the project (see Appendix 6). Female representation will therefore be encouraged in: i) the technical committee; ii) training sessions and workshops; and iii) activities for urban EbA demonstrations. The proposed urban EbA interventions will be gender sensitive and include the development of gender segregated targets and indicators to monitor progress throughout the project.

253. The SCCF-financed project activities will be informed by socio-economic assessments under Output 2.1 that will include a gender analysis. During these assessments, research

¹⁶⁷ CONEVAL. 2014. Pobreza y Género en México: hacia un sistema de indicadores. Información 2008-2012. Available at:

http://www.coneval.gob.mx/Informes/Coordinacion/Publicaciones%20oficiales/POBREZA_Y_GENERO_WEB.pdf

¹⁶⁸ A nuclear family has a father, mother and children.

¹⁶⁹ PUEG-UNAM. 2014. Available at:

http://www.pueg.unam.mx/images/numerosygenero/numeros_y_genero_4.pdf.

¹⁷⁰ CONEVAL. 2014. Pobreza y Género en México: hacia un sistema de indicadores. Información 2008-2012. Available at:

http://www.coneval.gob.mx/Informes/Coordinacion/Publicaciones%20oficiales/POBREZA_Y_GENERO_WEB.pdf.

¹⁷¹ PUEG-UNAM. 2014. Available at:

http://www.pueg.unam.mx/images/numerosygenero/numeros_y_genero_4.pdf.

¹⁷² Municipio de Xalapa. 2014. Plan Municipal de Desarrollo Xalapa 2014-2017.

¹⁷³ Centro de Integración juvenil. A.C. Estudio Básico de Población Objetivo. Available in: <http://www.cij.gob.mx/ebco2013/centros/9110SD.html>

¹⁷⁴ Municipio de Xalapa. 2014. Plan Municipal de Desarrollo Xalapa 2014-2017.

into the different capacities and coping mechanisms of men and women to adapt to the effects of climate change in the selected urban areas will be prioritised. Moreover, gender will be considered when: i) public awareness campaigns are designed; and ii) information materials are disseminated. Gender sensitivity will be incorporated into training topics so that: i) female participants are empowered to participate meaningfully in the trainings; and ii) all participants are made aware of their responsibility to respect the views of all of their colleagues during training workshops. Trainers will be required to have the skills and experience necessary to plan and facilitate gender-sensitive training.

254. The promotion of women's participation under the project is in line with GEF guidance and standards¹⁷⁵. In line with this, the Project Management Unit (NCU) and Project Steering Committee (PSC) will also include representatives of both genders. In addition, trainers will be required to have the skills and experience necessary to plan and facilitate gender-sensitive training. For example, training and awareness-raising activities will take place with an appropriate proportion of women and men and will be determined during consultations with local government and the selected urban communities. The project managers will be responsible for monitoring and reviewing gender sensitivity in the training activities and the application of gender-disaggregated indicators. Furthermore, the project will include measures to promote the needs of other disadvantaged and vulnerable groups including children, the elderly and disabled people, wherever possible, for example through monitoring the uptake of educational toolkits at schools.

Overall GEF conformity

255. The SCCF-financed project has been designed to meet overall GEF requirements in terms of implementation and design. The following core GEF criteria have been addressed.

256. **Sustainability:** Priorities for the SCCF-financed project include: training and capacity building of the national and local government and vulnerable urban communities. As such, EbA will be implemented in urban and peri-urban areas using a country-driven approach that promotes sustainability. Moreover, results and best practices will be documented thereby enabling urban EbA to be upscaled and extend beyond the project's lifetime (see Section 3.8 for more information on sustainability).

257. **Replicability:** The SCCF-financed project will systematically document the activities, management decisions, strategies, results and lessons learned. Such information will be used to guide the design and implementation of future similar projects (see Section 3.9 for more information on replicability).

258. **Monitoring and evaluation (M&E):** The design of the SCCF-financed project includes an effective M&E framework that will enable ongoing adaptive management. This will support the learning and dissemination of lessons by producing regular progress reports for stakeholder (see Section 6 for more information on M&E).

259. **Stakeholder involvement:** The SCCF-financed project design was developed through extensive stakeholder consultations (see Section 5 for more information). Moreover, the design of the project will make certain that a range of stakeholders will be engaged throughout the project implementation phase.

¹⁷⁵ GEF. 2008. Mainstreaming gender at the GEF. Washington, USA.

3.2. Project goal and objective

260. The overarching goal of the SCCF-financed project is to build the climate resilience of urban and peri-urban communities living in cities in the LAC region through the implementation of EbA approaches. The objective of the project is therefore to increase the capacity of government and local communities living in three medium-sized LAC cities to adapt to the effects of climate change through the integration of EbA into urban planning in the medium- to long-term.

3.3. Project components and expected results

261. The objective of the SCCF-financed project will be achieved through the implementation of activities under three main components. Component 1 will include activities to strengthen the technical and institutional capacity of stakeholders involved in urban planning and environmental management to integrate EbA into development planning within cities. This will support improved decision-making on climate change adaptation in urban areas in the LAC region, thereby promoting climate-resilient urban development. Under Component 2, on-the-ground, urban EbA interventions will be demonstrated in San Salvador (El Salvador), Kingston (Jamaica) and Xalapa (Mexico) to increase the capacity of urban communities living in vulnerable areas within the city to adapt to the effects of climate change¹⁷⁶. Activities under Component 3 will promote the generation, dissemination and management of knowledge on urban EbA in each city and across the broader LAC region, thereby supporting upscaling of the urban EbA approach. The outcomes, outputs and activities of these three components are detailed below.

Component 1: Enabling environment for mainstreaming EbA into medium- and long-term urban development planning.

Adaptation alternative

262. Under Component 1, the activities of the SCCF-financed project will create an enabling environment that facilitates the integration of EbA into medium- and long-term planning for urban development in San Salvador, Kingston and Xalapa. The objective of the mainstreaming is to reduce the vulnerability of urban communities living in these cities to the negative effects of climate change. Additionally, activities under this component will increase the technical capacity of government authorities and decision-makers for planning and implementing EbA interventions within urban communities. Revisions to relevant policies, strategies and plans will be developed to promote integration of EbA into: i) urban development; and ii) management of natural resources in urban areas. These revisions will be undertaken in collaboration with existing cross-sectoral committees involved in climate change planning in each country. These include the Urban Risk Management Committee (CGRU) in El Salvador, the Climate Change Advisory Committee (CCAC) in Jamaica and the Inter-ministerial Working Group on Adaptation (GT-Adapt) – as part of the CICC – as well as INECC in Mexico. Training provided under this component will focus specifically on enhancing the technical capacity for climate-resilient environmental management and urban development planning for: i) government departments such as MARN, MOPTVDU, MWLECC, SEDATU and SEMARNAT; ii) private sector stakeholders and NGO's in the fields of urban infrastructure and planning, forestry and water; and iii) urban and peri-urban

¹⁷⁶ These cities were selected according to a set of criteria in close coordination with national and local authorities (Appendix 18).

communities. In addition, a strategy will be developed to sustain and upscale EbA across urban and peri-urban areas in El Salvador, Jamaica and Mexico.

Outcome 1: Technical capacity of government stakeholders from urban development and natural resource management ministries to integrate EbA into planning, policies and regulations strengthened.

Output 1.1 Policy briefs developed to outline recommendations for revisions to policies, strategies and plans – including budget allocations – to integrate EbA into urban planning and management of natural resources.

263. National and sub-national policies, strategies and plans related to urban planning and environmental management for El Salvador, Jamaica and Mexico currently address certain aspects of adaptation to climate change (See Sections 2.4 and 2.6). However, these guiding frameworks do not include EbA as a cost-effective and low-risk approach to adaptation in urban areas. Revisions to these policies, strategies and plans will be formulated to promote EbA in urban and peri-urban areas. Initially, information on barriers and opportunities for integrating urban EbA into these frameworks will be collated for El Salvador, Jamaica and Mexico. Based on this information, entry points for the integration of urban EbA will be identified. This activity will be undertaken in close collaboration with relevant government departments responsible for management of natural resources and urban planning – including MARN, MOPTVDU, MWLECC and SEMARNAT. In addition, the following inter-ministerial committees will be included: i) the multi-sectoral CGRU in San Salvador¹⁷⁷; ii) the CCAC in Kingston; and iii) GT-Adapt, SEMARNAT – at national level – and the Veracruz Secretary of the Environment – at State level – in Mexico. The proposed revisions to policies, strategies and plans will be informed by lessons learned through implementing EbA interventions in other cities in the LAC region¹⁷⁸. Recommendations will also be made regarding budget allocations for the implementation of urban EbA in relevant sectors for each of these cities. Based on these recommendations, policy briefs will be developed and disseminated to policy- and decision-makers from ministries related to the management of natural resources and urban planning.

264. Activities to be implemented under Output 1.1 include:

- 1.1.1. Collate information on barriers to and opportunities for integrating EbA into policies, strategies and plans related to urban planning and environmental management for El Salvador, Jamaica and the state of Veracruz¹⁷⁹, Mexico.
- 1.1.2. Formulate revisions to relevant policies, strategies, plans and budgets to promote urban EbA in El Salvador, Jamaica and Mexico.
- 1.1.3. Develop policy briefs on the recommended revisions to policies, strategies, plans and budgets.
- 1.1.4. Hold meetings to present the recommended revisions to policy- and decision-makers from ministries related to the management of natural resources and urban planning. The policy briefs developed in activity 1.1.3 will be discussed at these workshops.

Output 1.2 Technical guidelines on planning and implementing EbA in urban areas developed for relevant government stakeholders, private sector and targeted communities.

¹⁷⁷ CGRU will validate the recommended revisions with the Cabinet of Sustainability.

¹⁷⁸ For example from Curitiba in Brasil and Rosario in Argentina.

¹⁷⁹ In Mexico, it is not feasible to do this at national level. Therefore it will be done at state and city level only.

265. Under Output 1.2, technical guidelines will be developed to facilitate the planning, implementation and monitoring of EbA interventions in San Salvador, Kingston and Xalapa. These technical guidelines will be developed in collaboration with relevant stakeholders including MARN and MOPTVDU in El Salvador, MWLECC in Jamaica and INECC in Mexico. The guidelines will consider innovative approaches for adaptation. Examples of these include *inter alia* closed loop systems for ecological sanitation, biomimicry¹⁸⁰ for infrastructure design, the broader pathways approach¹⁸¹ and the systemic modelling approach¹⁸². Thereafter, the guidelines will be disseminated to: i) technical government staff from departments related to management of natural resources and urban planning; ii) NGOs; iii) the private sector; and iv) urban communities. These guidelines will also align with existing regional frameworks – such as the Caribbean Community Climate Change Centre (CCCCC)¹⁸³ – that promote climate-resilient development in the LAC region. By strengthening the capacity of technical government staff, stakeholders from the private sector and urban communities, this output will support the implementation of EbA in an urban environment in alignment with the policies, strategies and plans revised under Output 1.1 of this project.

266. Activities to be implemented under Output 1.2 include:

- 1.2.1 Develop technical guidelines on planning, implementing and monitoring urban EbA interventions for technical government staff from departments related to management of natural resources – including MARN, MOPTVDU, MWLECC and INECC – and urban planning, NGOs, the private sector and target communities in San Salvador, Kingston and Xalapa. The guidelines will promote cross-sectoral coordination to increase the efficacy of the EbA interventions implemented.
- 1.2.2 Disseminate the guidelines to: i) technical government staff from departments related to management of natural resources and urban planning, NGOs and the private sector in El Salvador, Jamaica and Mexico; and ii) targeted urban and peri-urban communities in San Salvador, Kingston and Xalapa.

Output 1.3 Training provided to local government authorities and relevant private sector stakeholders in San Salvador, Kingston and Xalapa on implementing urban EbA.

267. The technical capacity of government authorities – such as MARN, MOPTVDU, MWLECC and INECC – in San Salvador, Kingston and Xalapa will be strengthened to implement adaptation interventions through training on the urban EbA approach. This training will include information on: i) the effects of climate change; ii) planning, implementing and monitoring urban EbA (using the protocols developed under Outcome 2); and iii) the benefits of EbA to adapt to climate change in urban areas. These training sessions will be organised in collaboration with academic institutions and NGOs that are experienced in undertaking training sessions. For example, the University of El Salvador and/or CATIE in Costa Rica could develop training material and provide training sessions in San Salvador. In Jamaica, this training could be organised in collaboration with the University of the West

¹⁸⁰Zari, M. P. 2015. Can biomimicry be a useful tool for design for climate change adaptation and mitigation? In: *Biotechnologies and Biomimetics for Civil Engineering*.

¹⁸¹ Wise, R.M. et al. 2013. Reconceptualising adaptation to climate change as part of pathways of change and response. *Global Environmental Change*. 28: 325–336.

¹⁸² Masson, V. et al, 2014. Adapting cities to climate change: A systemic modelling approach. *Urban Climate*. 10: 407–429.

¹⁸³ <http://www.caribbeanclimate.bz/ongoing-projects/2009-2021-regional-planning-for-climate-compatible-development-in-the-region.html>. Accessed on 28 May 2015.

Indies, Geography and Geology Department and the Climate Studies Group Mona. In Mexico, the Education and Training Centre for Sustainable Development (CeCadeSu) could develop the training material in collaboration with the appropriate academic institutions.

268. Towards the end of the SCCF-financed project, the training material will be refined based on lessons learned during project implementation to support a “Training of Trainers” (ToT) approach for national government authorities and relevant private sector representatives in San Salvador, Kingston and Xalapa. This training will promote the replication and upscaling of the urban EbA interventions in other cities in these countries. The ToT material will focus on skills pertaining to planning, implementing and monitoring of EbA interventions in urban and peri-urban areas.

269. Activities to be implemented under Output 1.3 include:

- 1.3.1 Develop training material on: i) the effects of climate change; ii) planning, implementing and monitoring urban EbA in each particular city; and iii) the benefits of using EbA to adapt to climate change in urban areas. Specific project details will be dealt with in the local context.
- 1.3.2 Provide training to relevant government stakeholders using the training material developed in Activity 1.3.1. Training will promote cross-sectoral coordination between stakeholders.
- 1.3.3 Refine training material developed in Activity 1.3.1 based on lessons learned during project implementation to inform ToT.
- 1.3.4 Provide ToT for national and local government authorities and relevant private sector representatives in El Salvador, Jamaica and Mexico on: i) the effects of climate change; ii) planning, implementing and monitoring urban EbA in each pilot country; and iii) the benefits of using EbA to adapt to climate change in urban areas.

Output 1.4 Strategies developed to upscale and sustain EbA interventions in El Salvador, Jamaica and Mexico.

270. Under this output, upscaling strategies for urban EbA in El Salvador, Jamaica and Mexico will be developed. These upscaling strategies will include: i) lessons learned through the SCCF-financed project and other related initiatives in the LAC region; ii) the benefits of urban EbA, particularly its cost-effectiveness relative to other approaches for adapting to climate change; iii) the need for cross-sectoral coordination to upscale urban EbA; v) recommendations for mainstreaming urban EbA into national and local development planning such as the NAP (in alignment with Output 1.1); vi) the roles and responsibilities of stakeholders in each country related to the upscaling of urban EbA approaches; and vii) sustainable financing mechanisms to support the upscaling of urban EbA in each country. Recommendations on accessing finance for urban EbA in each country in the long-term will also be included in the upscaling strategies. These recommendations will be based on *inter alia* the budget allocations to finance urban EbA proposed under Output 1.1. Furthermore, the upscaling strategies will include municipal roadmaps – developed with municipal planning authorities – for San Salvador, Kingston and Xalapa. These roadmaps will detail options for best-practice EbA interventions in urban areas – including those demonstrated through this project – –to promote long-term sustainability of these interventions. They will also illustrate priority areas for the implementation of EbA in each city. The upscaling strategies will be presented to and validated by national government stakeholders from the environmental and urban planning ministries and departments in El Salvador, Jamaica and Mexico.

271. Activities to be implemented under Output 1.4 include:
- 1.4.1 Design strategies – with relevant planning departments and ministries – to upscale EbA across urban and peri-urban areas in El Salvador, Jamaica and Mexico. This will start with the development of municipal roadmaps for San Salvador, Kingston and Xalapa to integrate best practice EbA and prioritise areas for this approach. The upscaling strategy will be supported by identifying and developing sustainable financing mechanisms as well as providing recommendations how to access funding.
 - 1.4.2 Hold workshops with national government stakeholders from environmental and urban planning departments and ministries in El Salvador, Jamaica and Mexico to present the upscaling strategies.

Component 2: Demonstration of urban EbA interventions in selected cities to enhance climate-resilience.

Adaptation alternative

272. Under Component 2, urban EbA interventions to build capacity to adapt to increased rainfall intensity as well as an increased frequency of drought will be implemented to demonstrate the benefits of these interventions to urban communities in San Salvador, Kingston and Xalapa. These interventions will contribute towards the development of a scientific evidence base to support investments in EbA and other innovative approaches to climate change adaptation in urban areas. During the PPG phase, vulnerable urban communities were identified in San Salvador, Kingston and Xalapa based on the current and future effects of climate change. As a first step to implementing EbA interventions, socio-economic assessments will be undertaken to gauge the current vulnerability of the selected urban communities – as well as their capacity to adapt – to the effects of climate change. Moreover, a gender analysis will be undertaken to assess the different adaptation needs of women to climate change based on their different socio-economic roles in the community. In addition, the socio-economic assessment will be used to determine and validate baseline values as well as midterm and end of year targets for gender. The socio-economic assessments will consist of household questionnaires and data obtained from the municipality and will focus on vulnerable groups¹⁸⁴ within the city. In addition, ecological assessments will be undertaken to: i) validate the selection¹⁸⁵ of plant species that are best adapted to drought and flooding for urban reforestation; and ii) identify environmental factors that influence the vulnerability of local communities. The results of the socio-economic and ecological assessments will inform the development of the scenario maps, which will identify specific climate-related risks under climate change conditions in the medium- and long-term. Thereafter, the EbA interventions that have been proposed during the PPG phase will be validated and refined on the basis of these scenario maps to align them better with the needs of the communities. Once the urban EbA interventions have been validated, protocols for these interventions will be developed to guide the implementation of this approach. These protocols will also be integrated into the training material developed under Outcome 1. In addition to implementing urban EbA within this component, climate-resilient livelihoods in the urban and peri-urban context will be promoted through demonstration activities such as productive food gardens and bee-keeping. The total number of people that will benefit from these EbA interventions is ~193,500 of which ~115,500 are in San Salvador; ~42,000 in Kingston and ~36,000 in Xalapa.

¹⁸⁴ These vulnerable groups include women, children, the poor and the elderly.

¹⁸⁵ The initial selection of plant species occurred during the PPG phase.

Outcome 2: Demonstration of EbA in San Salvador, Kingston and Xalapa to increase the capacity of urban and peri-urban communities to adapt to the effects of climate change.

Output 2.1 Assessments of climate change hazards, adaptation needs and scenario maps of resource availability produced for each pilot city.

273. Under this output, socio-economic assessments and scenario maps will be produced in collaboration with relevant stakeholders to identify vulnerability “hotspots” – such as areas at risk to floods – in San Salvador, Kingston and Xalapa. The socio-economic assessments will focus on the most vulnerable groups, such as women and youth. Particular emphasis will be given to the different capacities and coping mechanisms between men and women in the selected urban areas to adapt to the effects of climate change. A participatory risk analysis and focus group discussions with communities – disaggregated by gender – will be held to identify the threats, vulnerabilities and adaptation needs of the target community. The socio-economic assessment and risk analysis will serve to inform planning for building resilience to climate change for both men and women using EbA approaches. In addition, information will be collected on the community history regarding past vulnerabilities to climate-related hazards. Based on the community consultations and quantitative data, vulnerability maps will be developed for assessing the vulnerability of communities. These maps will then inform the prioritisation of areas and approaches for implementation of EbA interventions. The results of the assessments, analysis and mapping will in turn guide the development of policy briefs on climate change (see Output 1.1).

274. The information from the socio-economic and climate-risk assessments will be combined with information on predicted climate trajectories to develop scenario maps of future climate-related risks. Such scenario maps will show three climate scenarios – best, middle and worst case – and will be developed to guide planning on EbA interventions that have been identified during the PPG phase. Other data to be collated for the mapping exercise include *inter alia* predicted population growth, planned economic activities, urban development plans, disaster risks and land-use change. The scenario mapping exercise will enable the identification of current and future climate vulnerabilities and the development of worst-case scenarios. This will in turn inform the tailoring of project interventions to address local-level vulnerabilities. In addition, these will guide the revisions to planning frameworks (see Output 1.1) as well as the development of the upscaling strategy (see Output 1.4).

275. Activities to be implemented under Output 2.1 include:

- 2.1.1 Undertake assessments in San Salvador, Kingston and Xalapa to identify climate vulnerabilities and collect socio-economic data – including a gender analysis – on urban communities.
- 2.1.2. Collate data on factors that will most likely affect well-being of local communities, including population growth, planned economic activities, urban development plans, disaster risk, and land-use change.
- 2.1.3. Collate spatial data on climate trajectories at the city level for San Salvador, Kingston and Xalapa.
- 2.1.4. Combine all socio-economic and natural resource data to map the worst-case scenarios related to urban development, unplanned growth of the city, climate-related risks and resource availability under conditions of climate change.

Output 2.2 Protocols for city-specific EbA interventions developed.

276. Based on the scenario maps developed under Output 2.1, protocols will be developed for the implementation of EbA interventions at the water catchment, urban landscape and

household scales in San Salvador, Kingston and Xalapa to reduce the vulnerability of urban and peri-urban communities to climate change. These interventions are described in Output 2.3 below. The protocols will be developed in collaboration with relevant stakeholders such as *inter alia*: i) the CGRU with support from the MARN, MOPTVDU, Civil Defence, OPAMSS, local authorities and community groups through focus group discussions in San Salvador; ii) NEPA and the Forestry department in Jamaica; and iii) the Environmental Authority of the Xalapa Municipality. Importantly, these protocols will be informed by the biodiversity and ecosystem assessments undertaken in each of the pilot cities, as well as the vulnerabilities identified in the scenario maps (see Output 2.1). The protocols will be designed to promote an adaptive management approach. The technical training to be provided under Output 1.3 will be based *inter alia* on these protocols.

277. Activities to be implemented under Output 2.2 include:

2.2.1 Undertake rapid Environmental and Social Impact assessments in each of the project intervention sites.

2.2.2 Develop site-specific protocols for urban EbA implementation – at the water catchment, urban landscape and household scales – based on the worst-case scenario in Output 2.1 and assessments undertaken in Activity 2.2.1.

Output 2.3 Relevant urban EbA interventions demonstrated in San Salvador, Kingston and Xalapa at the household, urban landscape and urban catchment scale using the developed EbA protocols.

278. Currently, droughts in the dry seasons and floods during the rainy seasons are negatively affecting local communities in San Salvador, Kingston and Xalapa. The predicted effects of climate change – particularly increased rainfall variability – will exacerbate this (see Sections 2.1 and 2.6). Under Output 2.3, EbA interventions will be implemented at the watershed, urban landscape and household scale to address these climate-related problems, thereby increasing the capacity of urban communities to adapt to the effects of climate change.

279. In San Salvador, climate-resilient reforestation and conservation agriculture approaches will be implemented to restore the degraded Arenal-Monserrat watershed. These approaches will include: i) establishment of agroforestry gardens/orchards, which process will start with undertaking a baseline survey and then developing a management restoration plan¹⁸⁶; ii) demonstration of no-tillage to local communities; iii) the use of green manure to increase production of crops; and iv) construction of vegetated ditches on the slopes of the San Salvador volcano to reduce erosion and promote water infiltration. These approaches will enhance the ecosystem functioning of the San Salvador watershed by: i) reducing runoff and erosion on slopes during periods of heavy rainfall; and ii) increasing infiltration of rainwater and recharge of ground water. In addition, agricultural productivity will be improved for targeted peri-urban communities. Riparian vegetation will be restored using flood-resilient plant species. This restored vegetation will contribute to mitigating the impacts of more frequent and severe floods through slowing down the water flow and increasing water

¹⁸⁶ The agroforestry garden will promote organic agriculture and groups of farmers will be trained in soil conservation practices, with emphasis on: i) improving water infiltration; ii) no burning and management of stubble; iii) incorporation of green manure; and iv) diversification of crops, including permanent and semi-permanent crops with private terrace and/or infiltration ditches. Agroforestry systems will include a combination of basic grains with fruit trees, flowers, as live barriers. This will be done with active participation of communities in the area and municipalities while creating environmental monitoring groups.

infiltration. Rainwater harvesting systems at schools and infiltration wells will be implemented to mitigate the impacts of flooding during periods of heavy rainfall, and increase the supply of water available for urban communities during droughts. These infiltration wells will also regulate water flow, thereby reducing the flow of water during flood events and increasing water infiltration to the aquifer. One type of infiltration wells will be created to research the effectiveness and efficiency of this well for a single house with a depth of 1 m. The infiltration well will be constructed for ~30 houses.

280. In Kingston, EbA interventions will be implemented to mitigate the impacts of more frequent and severe floods and droughts on urban communities under conditions of climate change. Particularly in those areas of low-cost housing. The Hope watershed that surrounds Kingston will be restored using native drought-resilient tree species that have deep, soil-binding roots, *eg. Talipariti elatum* (Blue mahoe). This watershed restoration will: i) reduce rainwater runoff and erosion; ii) increase water infiltration and increase water availability at surface systems; and iii) stabilise soils thereby reducing the risk of landslides. These EbA interventions will include: i) constructing drains made from natural material to direct storm water runoff during heavy rainfall; ii) constructing detention ponds made from natural material to increase the availability of water during droughts iii) rehabilitating two hectares of *Rhizophora mangle* (red mangrove) in the urban wetland in Greenwich Town to contribute to flood mitigation; and iv) creating permeable pavements and walkways using grass and other appropriate plant species – such as *Moringa oleifera* – to increase water infiltration.

281. In Xalapa, revegetation and soil conservation at the watershed scale will be undertaken along the El Palenquillo stream using native riparian species adapted to regular flooding. These species will include *inter alia Inga vera* and *Pachira aquatica*, although the final selection will be made during the ecological assessment. The slopes of the Cerro del Estropajo hill will be restored using montane forest species – such as *Pinus* spp., *Quercus* spp., *Liquidambar* spp., *Magnolia schiedeana*, *Oreomunnea Mexicana*, *Chirantodendron pentadactylon*, *Cyathea* spp – as well as through the construction of infiltration ditches and retention berms to retain soil and increase infiltration. These infiltration ditches will be designed so as not to interfere with water flows needed by wetlands downstream. At the urban landscape scale, two linear walkways will be constructed to promote rainwater infiltration. One of these will be with permeable concrete and one with gravel. These permeable walkways will be used as a walking or cycling path and will reduce the volume of water contributing to the Carneros stream. In the green area of the Telesecundaria School Rafael Hernández Ochoa, an artificial wetland will be established to filter the water flow into the Carneros stream. The artificial wetland will also increase the water storage capacity for rainwater thereby reducing the runoff to the city. The maintenance of the wetland could be financed by selling the plants and flowers produced in this artificial wetland. Furthermore, a riparian park will be established along the Carneros stream. The planted trees will promote rainwater infiltration and improve regulated flow onto the river. In addition, the park will provide recreational opportunities for the urban community.

282. At the household scale, EbA interventions will be implemented in San Salvador, Kingston and Xalapa to reduce the vulnerability of urban communities in the face of climate change. Such EbA interventions will include: i) developing and implementing ecological sanitation plans to reduce the blockage of waterways from waste, thereby improving water flow and mitigating against the effects of floods; ii) constructing rainwater-harvesting systems at schools and public buildings (Xalapa) to increase availability of water during droughts; and iii) constructing an ecological sanitation system at schools in San Salvador to close the water cycle through rainwater-harvesting, including the management of grey water and sewage. This will allow the reuse of grey water and sewage, thereby reducing water consumption and

pollution. Importantly, the project will align with ongoing projects that focus on improving solid waste management in the city. These include for example the Jamaica Integrated Community Development Project and the FGB project in Xalapa.

283. Activities to be implemented under Output 2.3 include:

2.3.1 Implement appropriate EbA interventions at watershed, urban landscape (city) and household scales in San Salvador based on the protocols developed under Output 2.2 and using a learning-by-doing approach.

- developing 1,000 hectares of sustainable agriculture in the Arenal Monserrat watershed, including the construction of vegetated infiltration ditches on the slope of the San Salvador volcano¹⁸⁷;
- restoring 16 km of riparian vegetation in 4 ravines (4 km per ravine) using native fruit trees in the area, including: River Almond (*Andira inermis*), Ceder (*Cedrela salvadorensis*), Conacaste (*Enterolobium cyclocarpum*), Ojushte (*Brosimum alicastrum*), Ingas (*Inga vera*), Zapote (*Pouteria mammosa*), Nispero, (*Manilkara zapota*) Barillo (*Calophyllum brasiliense* var), Matazano (*Casimiroa edulis*);
- restoring 150 hectares of critical ecosystems including natural forest in Arenal-Monserrat adjacent to the volcano and the buffer zone of the protected area El Boqueron;
- constructing 30 infiltration wells (of 1 metre height) to improve water infiltration and increasing storage of storm water runoff;
- constructing rainwater harvesting systems for ten selected schools¹⁸⁸;
- establishing ecological sanitation (management of grey water and sewage) to close the water cycle at two selected schools; and
- constructing rainwater harvesting systems for the community of El Trebol including 71 families.

2.3.2 Implement appropriate EbA interventions in Greenwich Kingston based on the protocols developed under Output 2.2.

- planting 4,200 trees in the Hope watershed using drought-resilient tree species;
- rehabilitate 2 hectares of the wetlands in Greenwich Town to increase water storage;
- constructing 3 detention basins made from natural material to improve water infiltration and increase storage of storm water runoff;
- constructing 500 metres of dykes;
- constructing 2,500 metres of permeable pavements and walkways using grass and other appropriate plant species;
- rehabilitating 2.3 hectares in May Pen Park, in Kingston, including 400 fruit trees and 1,000 forest trees planted;
- constructing one rainwater harvesting system each at Camperdown High School, St Andrews Technical School, Kingston Technical College and Tivoli Gardens School; and
- constructing a rainwater harvesting system at two community buildings.

2.3.3 Implement appropriate EbA interventions in the Fernando Gutiérrez Barrios area in Xalapa based on the protocols developed under Output 2.2.

¹⁸⁷ The baseline study will say how many vegetated infiltration ditches will be needed. The 1,000 hectares includes 600 hectares to recovery and maintenance of coffee plantations and 400 hectares to slope stabilization with agroforestry.

¹⁸⁸ The names of the schools will be confirmed after a new director of education is elected in January 2016.

- restoring the area of the El Palenquillo stream by: i) planting 3,640 trees (1,820 on each side of the river, 2 metres apart); and ii) constructing infiltration ditches (0.6 metres deep, 0.5 metres wide, covered with 2 centimetres of gravel);
- restoring the Cerro del Estropajo hill by: i) planting 20,000 trees using cloud forest species; and ii) constructing 2,803 metres of infiltration ditches; and iii) constructing 1,667 metres retention berms to retain soil and increase the infiltration;
- constructing 200 m connectivity corridor between EbA action gardens;
- constructing 1,000 metres of linear park;
- constructing two permeable, concentric sports circuits – each 1,000 metres long – to promote rainwater infiltration (one constructed with permeable concrete, the other with gravel);
- constructing an artificial wetland in the green area of the Telesecundaria school Rafael Hernández Ochoa, which will also be used to cultivate ornamental plants; and
- installing 10 rainwater-harvesting systems (at 8 schools and 2 public buildings).

Output 2.4 Additional climate-resilient livelihoods from EbA promoted through training and demonstration in community spaces.

284. Within this output, the potential for developing additional climate-resilient livelihoods from EbA will be demonstrated in San Salvador, Kingston and Xalapa. These demonstrations will take place in or near community spaces – namely schools, cemeteries and parks – and will showcase the potential for EbA to supplement household/school income and decrease food insecurity during droughts, thereby supporting climate-resilient livelihoods of urban communities. Examples of such livelihoods – identified during the PPG – include: i) urban food gardening (including fruit tree fences); and ii) bee keeping. Other additional livelihoods will also be explored once detailed scenario maps and assessments have been undertaken.

285. Productive urban food gardens will be established in community spaces using drought-resilient plant and tree species that provide multiple benefits for urban communities and decrease their risk for food insecurity as a result of climate change. Examples and lessons learned will be derived from literature on sustainable multi-layered home gardens demonstrated elsewhere in Central and South America^{189,190}. In cases where community spaces do not have enough area for productive gardening, these gardens will be created using *inter alia* old car tyres and plastic or wooden boxes. To create these gardens, climate-resilient agricultural starter kits – containing seeds, “green” fertiliser and tools – will be provided to urban community members. In addition, training will be provided for targeted communities on: i) establishing and maintaining the urban food gardens; and ii) potential livelihoods from these food gardens. During the SCCF-financed project, strategies will be designed with the target communities to manage the urban food gardens in the long term¹⁹¹. Schools have been selected to pilot the use of food gardens in all three pilot cities. In San Salvador, this type of urban garden will be created at ten high schools, the same as mentioned in Output 2.3. In Kingston, the urban food gardens described above will be

¹⁸⁹ Gliessman, S.R. 1990a. Integrating trees into agriculture: The home garden agroecosystem as an example of agroforestry in the tropics. In *Agroecology: Researching the ecological basis for sustainable agriculture*, ed. S.R. Gliessman, Springer-Verlag, New York.

¹⁹⁰ Gliessman, S.R. 1990b. Understanding the basis of sustainability for agriculture in the tropics: experiences in Latin America. In *Sustainable agricultural systems*, eds. C.A. Edwards, R. Lal, P. Madden, R.H. Miller, & G. House. Soil & Water Conservation Society, Ankeny, Iowa.

¹⁹¹ During the PPG, community members near Tivoli cemetery in Jamaica suggested that “eco-patrolling” of the food gardens should take place.

established: i) at four high schools (St Andrews Technical College, Tivoli Gardens High School, Camperdown High School and Kingston Technical High School); ii) around the cenotaph of the adjacent May Pen cemetery; and iii) within 2.3 ha of the Tivoli Gardens park. The gardens that will be established at the cemetery will include locally adapted fruit trees that are drought resilient and have deep root systems, thereby promoting infiltration of water into the ground. Such trees would include *inter alia* *Blighia sapida* (ackees), *Artocarpus altilis* (breadfruit) *Mangifera indica* (mangoes) and *Averrhoa carambola* (starfruit). Fruit from these trees can either directly supplement food consumption or be sold to supplement household income¹⁹². Beekeeping will also be promoted in and around these urban community gardens and training will be provided to representatives from the community who show an interest to manage the hives. In Xalapa, 10 urban gardens will be created to produce food for schools, promote educational programmes and increase self-sufficiency. In addition, in areas within the Municipality of San Andrés Tlanelhuayocan, next to Xalapa, 20 demonstration plots will be established for edible mushroom cultivation and 24 stands for silvopastoral use to promote additional climate-resilient livelihoods. These activities will also mitigate pressure on the forest and improve the sustainable economic and social development of the population. Five training workshops will be conducted on improving forest management through *inter alia* organic fertilisation and organic forest pest control.

286. Activities to be implemented under Output 2.4 include:

2.4.1 Develop strategies and a benefit-sharing mechanism with targeted communities in San Salvador, Kingston and Xalapa for managing EbA interventions in community spaces that will demonstrate the potential for additional climate-resilient livelihoods including *inter alia*: i) urban food gardening (including fruit tree fences); and ii) bee keeping. The fruit trees and crops to be planted will be selected based on their tolerance to the predicted warmer climate and rainfall variability. In addition, bee keeping in urban areas will increase pollination of these crops and fruit trees thereby enabling the production of fruits thereby increasing food security for urban communities. Other additional livelihoods will also be explored once detailed scenario maps and assessments are undertaken.

2.4.2 Provide equipment to establish the EbA interventions that will demonstrate the potential for climate-resilient livelihoods.

- establishing two urban gardens at two high schools in the Arenal Monserrat area;
- providing agricultural start-up kits for 10 schools in the Arenal-Monserrat area;
- planting fruit trees as part of the agroforestry in the watershed area in Arenal-Monserrat;
- planting 400 fruit trees and 1,000 forest trees in 2.3 hectares in May Pen Park, in Kingston;
- providing 250 hives and equipment to promote bee keeping at the community space in May Pen Park in Kingston;
- planting 400 fruit trees along the perimeter of the football field at Tivoli High School;
- planting 400 fruit trees along the perimeter of Camperdown High School;
- providing equipment for container gardening at Kingston Technical School;
- providing equipment for the greenhouse and nursery as part of the agricultural improvement programme at St Andrews Technical College;

¹⁹² At schools the students will harvest the fruit and take it home. In the park, the fruit will be for the nearby community who will be responsible for maintaining the gardens. At project inception, arrangements for benefit sharing will be detailed and validated.

- installing 10 urban gardens in public spaces or schools in Xalapa;
- providing agricultural start-up kits for 8 schools in Xalapa;
- establish 20 demonstration stands for cultivating edible mushrooms in the Carneros water catchment in Xalapa; and
- establishing 25 modules for silvopastoral use in the Carneros water catchment in Xalapa.

2.4.3 Provide training for targeted communities to: i) establish and maintain the urban food gardens; ii) develop potential livelihoods from these gardens; iii) manage solid waste; and iv) maintain the EbA interventions.

Component 3: Knowledge and awareness of urban EbA throughout the LAC region.

Adaptation alternative

Under this component, the SCCF-financed project will promote the generation, management and dissemination of knowledge on urban EbA in El Salvador, Jamaica and Mexico. Initially, urban EbA communication strategies will be developed for the pilot cities in these countries. Thereafter, a set of appropriate communication tools will be identified and developed to increase the awareness of targeted stakeholders on EbA. To enhance awareness on climate change and EbA among the youth, educational toolkits will be developed for primary and secondary schools. Long-Term Research Programmes (LTRPs) will also be established to monitor the effects of the EbA interventions in each country during and after project implementation. To promote sustainability, these research programmes will be integrated into the existing climate change departments of the identified universities and research institutions. Lastly, information on urban EbA that will be generated through the SCCF-financed project will be shared through regional networks including *inter alia* REGATTA, CCCCC, Global Adaptation Network (GAN) and the UNEP EbA Flagship project the “Ecosystem-based Adaptation through South-South Cooperation” portal¹⁹³ and other regional networks, thereby contributing to the regional knowledge base and awareness on EbA.

Outcome 3: Knowledge of urban EbA interventions strengthened in El Salvador, Jamaica and Mexico as well as throughout the LAC region.

Output 3.1 Communication strategies developed to collate and disseminate knowledge on urban EbA.

287. Within this output, communication strategies for collating and disseminating knowledge on urban EbA will be developed for San Salvador, Kingston and Xalapa. These strategies will provide a framework for the communication of urban EbA information, including details such as: i) the responsibilities of government departments in collating, storing and disseminating data; ii) methods to promote cross-sectoral dialogue between ministries and departments for urban EbA planning; and iii) appropriate methods to disseminate knowledge on urban EbA to the general public. To support these communication strategies, an online portal for information on urban EbA will be developed for the LAC region. Where possible, these strategies will build on existing communication strategies related to climate change such as: i) the National Climate Change Plan and future communication strategies in El Salvador; and ii) the Communication for Climate Resilience communication strategy that has been developed for Jamaica. These communication strategies will be developed in coordination with relevant stakeholders such as the Commission of Environmental Sustainability, the CGRU, the MARN and the Ministry of the

¹⁹³ <http://www.ebasouth.org/>

Interior (MI) in El Salvador. In Mexico a communication strategy will be developed by INECC, in collaboration with academic institutions.

288. Activities to be implemented under Output 3.1 include:

- 3.1.1 Develop and implement communication strategies for urban EbA in San Salvador, Kingston and Xalapa.
- 3.1.2 Build on existing online portals in each city and country to share information on climate change and urban EbA.

Output 3.2 Public awareness communication materials developed and shared with decision-makers, community members and identified stakeholders.

289. Awareness-raising campaigns will be developed and implemented in San Salvador, Kingston and Xalapa to enhance understanding on the benefits of EbA in an urban environment and promote upscaling of this approach. The campaigns will increase public awareness on: i) current and predicted effects of climate change; ii) the role of EbA in mitigating these effects in an urban environment; and iv) best-practice urban EbA, including disaster risk management and climate-resilient livelihoods in urban ecosystems. Public awareness material will be developed and disseminated through various media, including posters, radio, social media and television. Importantly, the awareness-raising campaign will be tailored to target the variety of social groups in urban and peri-urban communities. For example, image-rich, visual media will be used to convey information in urban areas that have a low literacy rate. The awareness-raising activities will also be tailored to the preferences of different groups – men, women, the youth and the elderly – concerning their media of choice. Activities to be implemented under Output 3.2 include:

- 3.2.1 Develop appropriate awareness-raising material on urban EbA to adapt to the effects of climate change for *inter alia* social media, radio, TV, festivals, and posters.
- 3.2.2 Implement awareness-raising activities using the material developed in Activity 3.2.1 to increase the knowledge of the general public.

Output 3.3 A long-term research programme established on the benefits and cost-effectiveness of urban EbA interventions in the three pilot cities.

290. Long-Term Research Programmes (LTRPs) will be established to quantify the benefits of the urban EbA interventions that will be implemented through the SCCF-financed project. The LTRPs will be developed with – and institutionalised in – research institutes such as the University of El Salvador in San Salvador, the University of the West Indies in Kingston and the Institute of Ecology in Xalapa. In each country, Memoranda of Understanding (MoUs) will be signed between the project's executing agencies and these research institutions. These MoUs will detail the objectives of the LTRP – particularly relating to research themes – and the responsibilities of each signing party in quantifying the benefits of EbA interventions in the long-term. In particular, the LTRP will focus on measuring the costs and benefits of urban EbA, particularly for vulnerable urban communities. In San Salvador, this will be achieved in collaboration with the University of El Salvador (UES), the International Institute for Adaptation to Climate Change and Preventive Risk Management, MAG and MARN. In Jamaica, the activities will take place in collaboration with the Climate Studies Group Mona at the UWI housed within the Physics Department, with additional linkages to the Geography/Geology Department, UTech and the Northern Caribbean University (NCU). In Xalapa, the LTRP will be led by the Institute of Ecology / Universidad

Veracruzana. To start the Long-term Research Programme, students from these universities will be selected – and funded – to undertake research on the SCCF interventions during the lifespan of the project.

291. Activities to be implemented under Output 3.3 include:

- 3.3.1 Design and institutionalise LTRPs with selected research institutions in El Salvador, Jamaica and Mexico to monitor the effects of urban EbA interventions in a scientifically rigorous manner.
- 3.3.2. Develop MoUs between the executing agency of the SCCF-financed project and research institutions in each country to sustain the LTRP after project completion.
- 3.3.3. Develop and implement research projects with MSc and PhD students from partner research institutions on the costs and benefits of urban EbA implemented under Output 2.4, and the benefits of these interventions for vulnerable communities.
- 3.3.4. Disseminate the findings of the EbA research undertaken by the students through: i) presentations to government departments and institutions involved with urban development; and ii) publications in international and national journals.

Output 3.4 Educational toolkits detailing lessons learned and good EbA practices developed and shared with local, sub-national, national and regional authorities.

292. To increase awareness on climate change and EbA among the youth, educational toolkits will be developed for primary and secondary schools in El Salvador, Jamaica and Mexico. These toolkits will include a combination of lesson plans, small assignments and on-the-ground work such as designing small-scale EbA interventions that can serve as demonstration sites for surrounding urban communities to promote the uptake of these interventions in their own garden. Once the toolkits have been developed, schools will be selected to pilot the application of these toolkits. During PPG, St Andrews Technical College and Tivoli Gardens High School in Kingston indicated a willingness to pilot these toolkits. After the initial piloting phase, the toolkits will be refined – as necessary – and presented to the ministries of education in each of the countries. The toolkits will address themes such as general information on climate change and the role of EbA to manage the effects of climate change in an urban context. The activities under Output 3.4 will be informed by lessons learned from similar projects such as "Learning to Protect Us" implemented by MARN¹⁹⁴. In Mexico, the Ministry of Public Education (SEP) has already incorporated the topic of climate change into primary and secondary school education¹⁹⁵. CeCadeSu promotes educational communication by means of projects and public awareness campaigns. Representatives from this organisation will be engaged in developing the educational toolkits on EbA. Activities to be implemented under Output 3.4 include:

- 3.4.1 Develop educational toolkits on climate change and urban EbA for teachers at primary and secondary schools in El Salvador, Jamaica and Mexico.
- 3.4.2 Pilot educational toolkits with willing schools in San Salvador, Kingston and Xalapa. Refine the toolkits based on the outcomes of the piloting phase.
- 3.4.3 Hold a workshop to present the educational toolkits to the heads of schools and local authorities responsible for education in each city.

¹⁹⁴ Through this project, eight educational booklets on preventing natural disasters and a notebook on the impacts of climate change have been developed for primary school students.

¹⁹⁵ In Mexico, the national official text books are distributed freely to all public and private schools, and include topics on the science of climate change, mitigation and adaptation.

Output 3.5 Knowledge generated by the SCCF-financed project – including lessons learned – shared through web-based portals within the Global Adaptation network, including REGATTA.

293. To promote the replication and upscaling of urban EbA in the LAC region, the information generated by the SCCF-project will be shared through existing regional networks, including REGATTA, the CCCCC, the Global Adaptation Network (GAN) and the UNEP EbA Flagship website. The information to be shared will include *inter alia*: i) current vulnerabilities identified through the assessments (see Output 2.1); ii) scenario maps detailing future climate vulnerabilities (see Output 2.1); and iii) protocols on the implementation of EbA approaches to building climate resilience (see Output 2.2).

294. Activities to be implemented under Output 3.5 include:

- 3.5.1 Collate all information generated through the SCCF-financed project – including the results of the long-term research – on urban EbA in the LAC region through reports and other documents.
- 3.5.2 Disseminate the information generated by the project through REGATTA, CCCCC, GAN and the UNEP EbA Flagship website¹⁹⁶ as well as webinars and regional events to promote south-south learning.
- 3.5.3 Hold a regional workshop with relevant government authorities, EbA experts and the inter-ministerial committees to share information generated by the project.

3.4. Intervention logic and key assumptions

295. The activities of the SCCF-financed project will strengthen the institutional and technical capacity of government and urban communities in San Salvador, Kingston and Xalapa to adapt to the effects of climate change. At institutional level, this will include activities to integrate urban EbA into existing environmental policies and strategies at national and sub-national level. The technical capacity of sub-national government and urban communities in the three selected cities will be enhanced by i) raising awareness of the urban communities and policy- and decision makers on urban EbA; and ii) implementing urban EbA interventions at watershed, urban landscape and household scale. The lessons learned from the interventions and the research will be made accessible through the REGATTA network¹⁹⁷ – including an online knowledge platform – and the distribution of technical guidelines on urban EbA.

296. The SCCF-financed project was designed in consultation with multiple regional, national and sub-national stakeholders. As a result, the project's activities are aligned with the regional, national and city-specific development plans and strategies. In addition, the urban EbA interventions are designed based on the adaptation priorities of San Salvador, Kingston and Xalapa as well as the people living in the selected vulnerable urban communities. The participation of urban communities and government institutions (see Section 2.5) will promote ownership of the project stakeholders at the national and sub-national level. In particular, the support of the municipalities will enhance the long-term sustainability of the interventions.

¹⁹⁶ An agreement might be sought to blend this dissemination with the Massive Open Online Courses on Climate Change, fostered by the World Bank Group.

¹⁹⁷ REGATTA is the Regional Gateway for Technology Transfer and Climate Change in the LAC region.

297. The implemented urban EbA interventions under Outcome 2 are considered “low regret” or “no regret” options. This is because the interventions will generate benefits for government and urban communities irrespective of the effects of climate change. For example, activities under Outcomes 1 and 3¹⁹⁸ will support improved urban planning and the management of urban and peri-urban ecosystems. In addition, activities that focus on restoring urban ecosystems and promoting climate-resilient urban livelihoods (Outcome 2) will improve the provision of ecosystem services in the cities. This will enhance the cities’ climate resilience and the capacity of vulnerable urban communities to adapt to the effects of climate change. Lastly, interventions that support long-term research by postgraduate students will increase the human resource capacity and increase knowledge on best practices of urban EbA.

298. The following assumptions underlie the project design:

- Project interventions are unlikely to be undermined by extreme climate events during implementation.
- Priorities for climate change adaptation are unlikely to be undermined by national emergencies or civil unrest.
- The National and local governments of El Salvador, Jamaica and Mexico will support the project throughout its duration.
- There is adequate institutional and technical capacity to undertake preliminary studies and design the on-the-ground activities.
- Urban communities in the selected areas in each pilot city will accept and take ownership of the proposed interventions during and beyond the implementation phase of the project.
- The activities of the baseline projects will be implemented as planned.
- Infrastructure constructed during the project implementation will be safe from theft and vandalism.
- The demonstration sites are appropriately chosen to demonstrate the benefits of urban EbA.
- The small-scale adaptation interventions will be effective in reducing vulnerability to floods and droughts.
- Large-scale infrastructural developments – that would disrupt project activities – will not take place within the project areas during project implementation.
- Project results will be taken into consideration in the development of country-driven policies.

3.5. Risk analysis and risk management measures

299. To support the delivery of the project’s objective, there is a need to identify and assess the risks to implementation. Effective identification and assessment of risks will allow appropriate countermeasures to be taken. Monitoring and updating the identified project risks will be an important task of the RC throughout the project implementation phase. Table 7 summarises the identified risks and suggested countermeasures.

Table 7. Summary of the project risks and proposed countermeasures.

#	Description	Potential consequence	Countermeasures	Risk category	Probability & impact (1–5)

¹⁹⁸ These Outcomes focus respectively on strengthening the technical capacity and raising the awareness of the government and urban communities on urban EbA.

Regional-level risks					
1	Project managers and stakeholders at PSC have a limited overview of the overarching project objectives because of the project's multi-faceted, multi-country nature.	The effectiveness of project implementation is reduced.	<ul style="list-style-type: none"> A detailed plan and clear description of roles and responsibilities will be developed to ensure that all stakeholders are well apprised of the project across all three countries. 	Organisational	P=2 I=3
2	Poor coordination among project stakeholders because of language and geographical barriers.	Information on urban EbA is not shared effectively between the three countries.	<ul style="list-style-type: none"> The National Coordinator within each NCU will be responsible for ensuring appropriate coordination among project partners – particularly with the regional coordinator at ROLAC – and that GEF standards are met. Formal and informal communication and reporting functions between national and regional committees will be undertaken in both English and Spanish. 	Organisational	P=2 I=3
3	Natural disasters undermine the implementation of the EbA interventions.	Economic loss and/or damage to the interventions.	<ul style="list-style-type: none"> Meteorological predictions and conditions will be considered when planning the implementation phase of the project. Existing Early Warning systems (e.g. in San Salvador) will be used during project implementation. 	Ecological	P=4 I=3
National level risks					
4	Limited inter-sectoral data sharing.	The timely delivery and effectiveness of the project is reduced.	<ul style="list-style-type: none"> The existing cross-sectoral committees and mainstreaming mechanisms in each country will be used to promote communication and information sharing 	Political/ Organisational	P=2 I=3

			<p>between sectors.</p> <ul style="list-style-type: none"> Information technologies and telecommunication systems selected will be those suited to the local context and which do not restrict the transfer and communication of information. 		
5	High turnover of staff in implementing agencies.	Reduced institutional memory results in disruptions or delays in project implementation and coordination.	<ul style="list-style-type: none"> Dialogue between stakeholders will be promoted during the implementation phase and deputy representatives appointed to ensure continuity. The process of project decision-making and implementation will be well documented. Technical guidelines will be developed in both English and Spanish to guide new staff who become involved in the project. 	Political/ Organisational	P=3 I=3
6	Government will have insufficient funds to sustain the local structures ¹⁹⁹ , once the project ends.	Upscaling of the urban EbA interventions will be limited.	<ul style="list-style-type: none"> A strategy will be developed to upscale, sustain and replicate the planning, implementation and monitoring of EbA interventions in other cities. Mechanisms will be developed to help mobilise funds – particularly from the private sector – to maintain the EbA interventions after the project lifespan. Decision-makers will be trained on how to identify funding opportunities and write project proposals during the project. 	Organisational	P=2 I=3

¹⁹⁹ Local structure include for example the research programmes and EbA projects to be implemented under the existing climate change units/committees.

Local-level risks					
7	The implementation of the EbA interventions is undermined by social unrest within the target communities.	Project activities are delayed.	<ul style="list-style-type: none"> The selection of the intervention sites will take into account past occurrences of social unrest within the target communities. The Project Manager and CTA will keep abreast of socio-economic developments in the pilot cities and develop contingency plans for the target communities if necessary. 	Socio-economical	P=2 I=3
8	The communities at the selected intervention sites do not support the proposed urban EbA interventions.	Limited support from the target communities may prevent the achievement of the immediate as well as long-term benefits of the project.	<ul style="list-style-type: none"> Communication with urban communities will be undertaken to create public awareness and support for the EbA interventions. Local stakeholders will participate in project planning, implementation and monitoring. The project will include raising awareness on the benefits of EbA. 	Socio-ecological	P=1 I=3
9	Unsustainable land and natural resource use.	Unsustainable use of natural resources continues, leading to further degradation of ecosystems.	<ul style="list-style-type: none"> Awareness-raising campaigns will be held on the value of intact and functional ecosystems for surrounding communities. Local communities will be actively engaged during implementation and monitoring of the EbA interventions. 	Social	P=3 I=4
10	Local zoning and land use plans compete with EbA interventions.	The efficacy of the EbA interventions is undermined.	<ul style="list-style-type: none"> The project will include representatives from the land use and urban planning departments to inform them from the inception phase on the location of the EbA interventions. In addition, formal agreements will be established to ensure that the EbA 	Institutional	P=3 I=4

			interventions will not be undermined by future urban development plans.		
11	Large-scale infrastructure development in the cities during implementation	Project activities are disrupted or delayed.	<ul style="list-style-type: none"> The coordinators will collaborate with relevant government agencies to ensure appropriate coordination between all ongoing projects in the intervention sites as well as to take into account urban development plans before embarking on any activities. 	Economic/ Institutional	P=2 I=3

3.6. Consistency with national priorities or plans

300. The SCCF-financed project will support and complement the national plans and strategies in each country that are related to urban development, climate change and the environment in general. The project is aligned with the NCs, NBSAP and TNA's of the respective countries (see Section 2.4). The main national strategies of each country/state and city with which the SCCF-financed project will align and comply are outlined below.

El Salvador

301. In preparation for **the Second National Communication (2013)**, the Government of El Salvador has already undertaken several steps to address these effects, including: i) adoption of the National Policy of the Environment that prioritises the risks of climate change; ii) formulation and launch of the restoration programme that promotes adaptation to climate change, such as the National Programme on the Restoration of Ecosystems and Landscapes (PREP); iii) development of the National Strategy on Climate Change that focuses on adaptation; iv) identification of priority technologies for adaptation to climate change; and v) activities to raise public awareness on climate change. These efforts have contributed to the development of the National Strategy on Climate Change. The SCCF-financed project will align with the SNC by developing and implementing activities to assist urban communities in San Salvador to adapt to the effects of climate change. In addition, under Component 3, the SCCF-financed project will build on the raised public awareness on climate change by adding the EbA approach as a tool to adapt to the effects of climate change.

302. The **National Environmental Policy (2012)** is to reverse environmental degradation and reduce vulnerability to climate change through six priority lines of action. This policy guides the action of the public, central and local government in the implementation of plans and programs. The SCCF-financed project will align with this policy by contributing to the restoration of degraded urban and peri-urban ecosystems in San Salvador through reforestation and the construction of infiltration ditches on the slopes of the San Salvador volcano to reduce erosion and water runoff.

303. **The National Climate Change Strategy (2013)** provides guidance on the development of sectoral strategies and plans that will be part of the first National Climate

Change Plan and will include participation of national and sub-national governments, CSOs and local communities. The strategy is structured around three main areas, namely: i) financial mechanisms to address recurring losses and damages, ii) climate change adaptation; and iii) climate change mitigation. As part of the SCCF-financed project interventions, this plan will likely be revised to identify entry points for EbA.

304. Within **El Salvador's National Five-year Development Plan (2014–2019)**, objective 7 describes the action plans for the development of El Salvador towards an economy and society that is sustainable and resilient to the effects of climate change. These action plans include the restoration and conservation of degraded ecosystems, and reduction of the vulnerability of communities to the effects of climate change. The development plan emphasises that an adequate response to climate change requires the integration of climate change into the energy, water and economy sectors. Furthermore, the development plan mentions that the disorganised expansion of urban areas contributes to the vulnerability of urban communities to the effects of climate change. The SCCF-financed project will complement the action points under objective 7 by promoting urban EbA as a cost-effective approach to adapt to climate change.

305. The first **National Plan on Climate Change (PNCC)** was published in June 2015. The SCCF-financed project will align strongly with this plan under all components. In particular under Component 1 of the project, the PNCC will be supported to promote the inclusion of urban EbA as a cost-effective tool to adapt to the effects of climate change. The PNCC is the framework to coordinate: i) public administration and intersectoral policy assessments; and ii) the impacts and vulnerability of different sectors and systems to adapt to climate change. The main objective of the PNCC is to integrate climate change adaptation into the planning and management of national socio-economic sectors and ecological systems. The project will align with the PNCC by developing and implementing EbA activities to assist urban communities in San Salvador to adapt to the effects of climate change and contribute to component 3 to 7 of the PNCC. Under Component 3 of the SCCF-financed project, the raised public awareness on climate change of PNCC's component 8 will be built upon by including the EbA approach as a tool to adapt to the effects of climate change. Under Component 1 of the SCCF-financed project, the PNCC will be supported by developing policy briefs and proposing revisions to policies, strategies and plans – including budget allocations – to: i) integrate EbA into urban planning and management of natural resources; and ii) to develop strategies to upscale and sustain EbA interventions in El Salvador after the lifespan of the project. In particular, these interventions will support components 1 and 2 of the PNCC.

306. **The National Biodiversity Strategic Action Plan (2014)** focuses on large-scale restoration and conservation, of the country's ecosystems, with the aim to establish favourable environment conditions to sustain current and future development. The strategy is structured along three main goals as well as priority areas, namely: i) biodiversity mainstreaming in the economy particularly in agriculture, fisheries and aquaculture, and tourism sectors; ii) restoration and conservation of critical ecosystems such as rivers and wetlands, and forest ecosystems; and iii) inclusion of biodiversity as local economic options. The action plan is currently in the process of being developed. Once the entry points for EbA have been identified, the action plan will likely be revised during the implementation phase of the SCCF-financed project to integrate urban EbA.

307. **The National Programme on the Restoration of Ecosystems and Landscapes (PREP) (2012–2016)**. The SCCF-financed project is aligned with the PREP by transferring

PREP activities undertaken in rural areas to urban areas through sustainable agriculture interventions on the slopes of the San Salvador volcano.

308. **The Environmental Strategy for Adaptation and Mitigation to Climate Change in Agriculture, Forestry and Aquaculture Sector** (2012) is executed by the MAG²⁰⁰. The strategy aims to contribute to the adaptation of the impacts of climate change on agriculture, forestry, fisheries and aquaculture, with a focus on sustainable watershed management. The SCCF-financed project will align with this strategy through its activities under the 3 components. The strategy highlights the importance of the agricultural sector for food production, SCCF-financed project will contribute to this strategy through the school gardens. In addition, the strategy promotes inter-institutional collaboration with the MARN and the design of good agricultural practices with the PREP through a communication campaign that is aimed at agricultural producers using radio and television spots. Under component 3 of the SCCF-financed project this campaign will be strengthened by including EbA as a cost-effective approach for adaptation to climate change.

309. **The National Strategic Plan for Food Security and Nutrition** (2013–2016) is executed by The National Council for Food Security and Nutrition²⁰¹ and integrated by the Minister of Health, the Secretary of Social Inclusion, the Technical Secretary of the Presidency and the MAG, to achieving the first Millennium Development Goal. The SCCF-financed project will align with this strategic plan by developing urban gardens as an additional climate-resilient livelihood to contribute to the food security of the urban communities in San Salvador.

310. **The Environmental Law** (1998). Within the "Environmental Law, **The Special Regulations for the integrated management of solid waste** (2000) is created to regulate the management of solid waste. The scope of it includes solid waste from household, commercial or institutional services. The SCCF-financed project will align with this law when developing a community solid waste management plan under Outcome 2.

311. **Law on territorial planning and development** (2011) provides a framework to regulate land use planning and institutions to develop territorial management of public and private activity and meet standards on land use and resource management. The SCCF-financed project will comply with this law when developing and constructing the EbA interventions at urban landscape and watershed scale.

312. **United Nations Development Assistance Framework (UNDAF) Action Plan** (2012 – 2015). The UNDAF articulates five priority areas for this period. These include: i) equity, including poverty reduction; ii) inclusive economic development; iii) democratic and reformed governance; iv) Security of the city and prevention of violence; and v) environmental sustainability and reduction of disaster risks.

Jamaica

313. **Third National Communication (TNC) and First Biennial Update Report (BUR) to the UNFCCC** (2014–2017) is funded by the GEF Trust Fund and the UNDP/GOJ with a total

²⁰⁰ Ministerio de Agricultura y Ganadería (MAG), 2012, Estrategia Ambiental de Adaptación y Mitigación al Cambio Climático del Sector Agropecuario, Forestal y Acuícola. (<http://www.mag.gob.sv/phocadownload/Planes/estrategia%20ambiental%202012.pdf>)

²⁰¹ http://www.bvselsalvador.net/bvsan/sites/default/files/plan_CONASAN_1.pdf

amount of US\$1,052,000, and being executed by the MWLECC. These institutions assist Jamaica with the implementation of the obligations under the United Nations Framework Convention for Climate Change. The project has six Outcomes. Of these the SCCF-financed project will align with the following i) National circumstances, stocktaking, constraints and gaps; iii) Programmes, actions and plans developed using improved V&A methodologies and tools; and vii) Monitoring and evaluation. The SCCF-financed project will build on the stocktaking undertaken under Outcome 1 and the programmes, actions and plans developed under Outcome 3 to prevent any duplication of efforts.

314. **Vision 2030 Jamaica – National Development Plan** provides a comprehensive planning framework in which the economic, social, environmental and governance aspects of national development are integrated. This plan will likely be revised as part of the SCCF-financed project interventions to integrate urban EbA.

315. A **National Communication Strategy and Action Plan entitled “Communication for Climate Resilience (2012-2017)”** has been prepared for the Pilot Programme for Climate Resilience (PPCR). Under Component 3 of the SCCF-financed project, the development of a communication strategy at city level will align with this national communication strategy and take into account lessons learned and will build on the awareness raised.

316. The SCCF project is consistent with the **Jamaica National Environmental Action Plan (JaNEAP)**. The SCCF-financed project will align with this action plan for a sustainable development of the urban EbA interventions in Kingston.

317. **The Climate Change Policy Framework** is implemented and funded by the GoJ, the European Union and UNEP. The main objective of the programme is to support the Vision 2030 by reducing the risks posed by climate change to Jamaica’s sectors and development goals. The goal of the SCCF-financed project is to reduce the vulnerability of targeted communities to climate change. This will support the main objective of this action plan to manage the effects of climate change in Jamaica.

318. The **Water Sector Adaptation Strategy to Address Climate Change (2008)** provides an assessment of the water sector’s vulnerability to climate change and outlines the duties of the GoJ and other stakeholder groups in helping to build the resilience of the sector against climate change and other potential hazardous impacts. The SCCF-financed project will align with this strategy when developing the urban EbA interventions that specifically address flooding in Kingston, such as the water harvesting, reforestation at watershed scale and the rehabilitation of the urban wetland.

319. **The Strategic Forest Management Plan (2010-2014)**. The SCCF-financed project will align with this plan under Component 2 regarding the reforestation of part of the Hope watershed and the revegetation of the riparian areas in Kingston.

320. **The National Biodiversity Strategy and Action Plan (NBSAP) (2003)** does not have a particular focus on the effects of climate change on biodiversity. However, the GoJ is currently updating its NBSAP with GEF funding to include climate change and is expected early 2016. The SCCF-financed project will align with this plan under Component 2 using endemic and native tree species for reforestation of the watershed and the revegetation of the riparian area and community urban garden.

321. **The National Building Code** has been developed to establish new guidelines for the construction of hurricane resistant buildings across the island.

322. **United Nations Development Assistance Framework (UNDAF) Jamaica (2012 – 2016)**. The framework will focus on the following three areas: i) Environment; ii) Social Empowerment and Equity; and iii) Safety, Security and Justice.

Mexico

Mexico has a National Strategy for Biodiversity (2000) but this has not been updated recently. The strategy has very few references to climate change. There is no separate communication strategy on climate change, but the subject is included in the ENCC and the PECC. In addition, all urban planning and construction has been implemented with insufficient without reference to climate change, apart from the development of urban NAMAs.

323. **The Fifth National Communication (FNC) (2012)**. In particular, the Fifth National Communication states the need for: i) undertaking risk assessments that include climate change to better prepare cities for natural disasters; ii) strengthening institutional capacity to adapt the urban growth model; iii) providing training on climate change at schools; iv) developing roadmaps for the implementation of large-scale pilot projects; and v) providing funding to implement the climate change action plans in states and municipalities. The activities under the SCCF-financed project are aligned with the FNC as these will contribute to the identified capacity gaps on adaptation to climate change. In addition, the project will build on ongoing activities to further contribute to the goals set in the FNC to reduce the vulnerability of urban communities to the effects of climate change.

324. Mexico's **General Law on Climate Change (LGCC) (2012)** The SCCF-financed project will align itself with the provisions of the LGCC, in particular with its Chapter II, Art 27, 28, 29 and 30.

325. The objective of **Veracruz's State Law for Climate Change Adaptation and Mitigation (2010)** is to formulate and implement public policies for: i) climate change adaptation; ii) climate change mitigation; iii) protection of the state's inhabitants; and iv) sustainable development within the Veracruz State. The proposed revision of the policies and plans under Output 1.1 of the SCCF-financed project will be aligned with this law.

326. The SCCF-financed project is consistent with **Mexico's National Climate Change Strategy (ENCC) (2013)**. In particular, the project is aligned with strategic objectives A1 and A3 which aim to "reduce vulnerability and increase resilience of the social sector towards climate change effects" and "conserve and manage ecosystems sustainably to maintain the environmental services they provide" respectively.

327. The **Special Programme on Climate Change (PECC) (2014–2018)**. Through the long-term research programme under Component 3, the SCCF-financed project is aligned with this programme regarding the long-term planning and sustainability of the EbA interventions.

328. **Climate Change Programme for the State of Veracruz (PVCC) (2009)**. The SCCF-financed project aligns with this programme through the reforestation of riparian areas along the Sedeno River and assists urban communities adapt to the effects of climate change in the short term through the installation of rainwater harvesting systems.

329. **The Climate Change Fund.** The purpose of this fund is to mobilize public, private, national and international financial resources to support the implementation of actions needed to face climate change. Adaptation measures are considered priorities in the use of the resources from the fund. The SCCF-financed fund will provide recommendations to this fund to promote the spending on urban EbA.

330. **The Intended National Determined Contribution (INDC) (2015).** The SCCF-financed project is aligned with the INDC under all three components and particularly Component 2 regarding increasing the resilience of urban communities and ecosystems to the adverse effects of climate change. For more information on the INDC, please see Section 2.4.

331. **The National Water Law (1992).** The SCCF-financed project will comply with this law when developing the urban EbA interventions that specifically address flooding in Xalapa, such as establishment of the water harvesting systems, reforestation at watershed scale and the creation of permeable pavements at urban landscape scale.

332. **The National Water Plan 2014-2018 (PNH-Plan Nacional Hídrico).** The PNH, in its Strategy 2.2. refers specifically to the “reduction of vulnerability with respect to climate change and climate variability”, by means of: i) increasing the participation and co-responsibility of States and municipalities in adaptation actions; ii) creating or reinforcing financial funds for climate change adaptation; iii) increasing the exchange of information with national and international institutions.

333. **The General Law for Civil Protection (2012).** This legislation established a cross-sectoral National System for Civil Protection, embracing the Federal, State and Municipal levels, as well as the civil society. Its provisions include more severe penalties for the construction of infrastructure and human settlements in areas at risk.

334. **General Law on Sustainable Forest Development (2003).** This law includes a full recognition of the economic and social value of the environmental services provided by forest ecosystems. The National Forestry Commission has been carrying out for over ten years a Programme of Payment for Environmental Services (hydrological, of biodiversity, carbon) that may be used for EbA purposes.

335. **National Biodiversity Strategy Action Plan (NBSAP) (2000).** The SCCF-financed project will align with this plan under Component 2 using endemic and native tree species for reforestation of the watershed and the revegetation of the riparian area and community urban garden.

336. **United Nations Development Assistance Framework (UNDAF) (2014 –2019).** The UNDAF focuses on six areas: i) equality and social inclusion; ii) economic development; iii) the environment and green growth; iv) security and justice; v) democratic governance; and vi) the above-mentioned Global Partnership for Development.

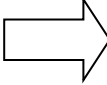
3.7. Additional cost reasoning

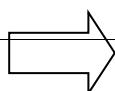
337. Urban and peri-urban ecosystems provide a range of ecosystem services, including: i) the provision of natural resources such as food and water; and ii) regulatory functions such as flood mitigation, water filtration and waste decomposition). Currently, these ecosystems are being degraded by unplanned urban expansion in San Salvador, Kingston and Xalapa.


The effects of such ecosystem degradation include: i) reduced water infiltration because of catchment hardening which leads to reduced groundwater availability and increased flooding; ii) increased soil erosion as a result of degradation of forests and wetlands caused by urban expansion; and iii) decreased water quality as a result of increasing pollution in rivers and other water ways. The negative effects of climate change – including an increased frequency and intensity of floods and droughts – will exacerbate ecosystem degradation and reduce the provision of ecosystem services to vulnerable communities. Without the SCCF-financed project, urban communities in the LAC will continue to experience *inter alia*: i) reduced water availability for household use; ii) decreased food security as urban and peri-urban farming becomes less productive; and iii) greater risks to health from the increased frequency and severity of climate-related disasters, and the prevalence of vector and water-borne diseases.


338. The SCCF-financed project will reduce the vulnerability of urban communities to the effects of climate change by implementing urban EbA interventions that are informed by scientific research and local knowledge in San Salvador, Kingston and Xalapa. These interventions will enhance the provision of ecosystem services – including flood protection, water quality maintenance and erosion prevention – regardless of climate-related effects. In addition, the urban EbA interventions of the project will increase the climate-resilience of the baseline projects in the three selected cities. Table 8 below describes the business as usual scenario compared with the alternative adaptation scenario in more detail for each outcome.

Table 8. Comparison of the business-as-usual scenario to the alternative adaptation scenario.

	Business-as-usual		Alternative adaptation scenario
Problem Description	Urban and peri-urban ecosystems in San Salvador, Kingston and Xalapa provide a wide range of ecosystem services for urban communities, including <i>inter alia</i> water provision, water infiltration and waste decomposition. Increasing temperatures and rainfall variability as a result of climate change have affected the provision of these services and consequently impacts on the livelihoods of urban communities. The vulnerability of urban communities is exacerbated by i) rapid urbanisation that reduces the functioning of urban and peri-urban ecosystems; ii) increased frequency and intensity of natural disasters; and iii) limited technical capacity to adapt to climate change.		The SCCF-financed project will demonstrate the benefits of EbA and build capacity of poor urban communities to adapt to the effects of climate change. This will be achieved by implementing urban EbA intervention at watershed, urban landscape and household scales. The interventions will contribute to <i>inter alia</i> i) reduced flooding; ii) improved water availability during periods of drought; and iii) improved water quality.
Project Outcomes	Outcome 1. There is currently: <ul style="list-style-type: none"> Limited sharing of experience and information between adaptation-related initiatives – particularly between and within relevant government departments, the private 		The project will: i) promote coordination between and within relevant government departments, the private sector and research institutions on using EbA to adapt to climate change; and ii) increase the technical capacity of the relevant stakeholders to plan, implement and



	<p>sector and research institutions.</p> <ul style="list-style-type: none"> • Limited awareness on urban EbA as an approach for climate change adaptation. • Limited integration of urban EbA into national and sub-national strategies, plans and laws. • Limited technical capacity of sub-national government to raise awareness about the effects of climate change within urban communities. • Limited finances to promote and upscale urban EbA across the LAC region. 		<p>monitor urban EbA. The activities under this Outcome will develop an enabling environment for national and local government in the LAC region to promote the upscaling of urban EbA. This will be done by:</p> <ul style="list-style-type: none"> • Recommending revisions to national and local strategies, plans and laws to integrate urban EbA and promote the implementation of the national strategies for adaptation. • Building on existing frameworks for cross-institutional coordination and sharing of technical information on urban EbA thereby promoting the effective implementation of urban EbA interventions. • Providing training to local and national government on urban EbA to increase the technical capacity to plan, implement and monitor urban EbA interventions. • Developing a strategy to upscale the urban EbA interventions, including a sustainable financing mechanism with budget allocations. <p>Cost: SCCF US\$509,633</p>
	<p>Outcome 2. At present:</p> <ul style="list-style-type: none"> • Current climate change related projects do not include the use of the EbA approach to adapt to climate change. • Current climate change related projects do not consider the future effects of climate change. • Adaptation interventions will only be implemented at one scale and in isolation of other project without considering the full scope of the effects of climate change. • Adaptation interventions do not consider the effects of climate change on vulnerable urban communities, particularly women and children. • Urban and peri-urban ecosystems are being degraded as a result of uncoordinated urban planning and unsustainable use of water resources. • Natural disasters – such as 		<p>The urban EbA interventions implemented across the three scales in San Salvador, Kingston and Xalapa will restore urban and peri-urban ecosystems in these cities, thereby reducing the vulnerability of urban communities to the effects of climate change. In addition, the interventions will: i) promote the EbA approach as an option to adapt to climate change; ii) increase the preparedness for natural disasters; and iii) increase the adaptive capacity of urban communities to climate change. This will be achieved through <i>inter alia</i>:</p> <ul style="list-style-type: none"> • Assessing the capacity of urban communities to adapt to the effects of climate change. This will identify the adaptation needs and guide the design of the interventions. • Integrating scientific research with local knowledge to tailor the design and development of urban EbA interventions. • Support the functioning of climate-resilient ecosystems through the implementation of improved water conservation and waste management

	<p>hurricanes and storm surges – are exacerbated by the effects of climate change, thereby damaging urban infrastructure and livelihoods.</p> <ul style="list-style-type: none"> • There is limited knowledge on best practices to implement urban EbA interventions. • Urban wetlands have reduced water storage capacity because of pollution and unregulated solid waste management. • Urban communities remain vulnerable to the effects of climate change. 		<p>techniques. For example: rainwater harvesting at schools and waste management and recycling programmes.</p> <ul style="list-style-type: none"> • Developing and promoting alternative climate-resilient livelihoods. • Developing or updating a community strategy to maintain the alternative livelihoods after the SCCF-financed project's lifespan. <p>Cost: SCCF US\$4,415,780</p>
	<p>Outcome 3. There is currently:</p> <ul style="list-style-type: none"> • Limited awareness on urban EbA to adapt to climate change. • Limited long-term research on climate change adaptation, particularly urban EbA. • Limited monitoring of the results of ongoing adaptation-related interventions beyond the lifespan of adaptation projects. Consequently, there is no proof-of-concept from lessons learned. • Limited mechanisms exist to share technical knowledge on urban EbA within the LAC region. 		<p>The SCCF-financed project will promote the generation and sharing of evidence-based knowledge of urban EbA across the LAC region. This will be achieved by:</p> <ul style="list-style-type: none"> • Implementing an awareness campaign on climate change adaptation, including the benefits of urban EbA. • Developing a research programme in collaboration with national research institutes to monitor the long-term effects of the urban EbA interventions. • Collecting and updating information on past and on-going research on climate change adaptation in El Salvador, Jamaica and Mexico. • Using existing online information platforms – such as the REGATTA, GAN – to disseminate information and lessons learned on the urban EbA interventions. <p>Cost: SCCF US\$613,350</p>
Cost	Business-As-Usual Development Cost		Additional Adaptation Cost
Financed by:	Ministry of Planning and Public Works (MOP) (El Salvador), Jamaica Social Investment Fund (JSIF), and CONAGUA/Municipality of Xalapa (Mexico).		SCCF

3.8. Sustainability

339. The sustainability of the SCCF-financed project's investments will be supported by the: i) active participation of all relevant stakeholders in the decision-making and implementation of the project activities; ii) strengthened institutional and technical capacity of national and local government to monitor the EbA interventions and maintain the benefits of the interventions; iii) increased public awareness of the benefits of urban EbA to support and maintain the activities beyond the project lifespan; and iv) collection, analysis and

dissemination of the results generated through the long-term research programme on urban EbA interventions. Details of these approaches are described below.

340. The SCCF-financed project was developed in close consultation with regional, national and local stakeholders including representatives of international and national NGO's, representatives from government in each country, the private sector, city authorities and representatives from the selected communities in Arenal-Monserrat in San Salvador, downtown Kingston, and Fernando Gutiérrez Barrios in Xalapa. These stakeholders will continue to be consulted during the implementation of the project. For example, workshops and other forms of participatory consultations will be held to promote the adoption of climate resilient urban livelihoods identified by the selected communities. This participatory approach will promote ownership of the project by the stakeholders, which will in turn contribute to the sustainability of the project.

341. The technical capacity of stakeholders in the three selected cities will be strengthened through building on existing frameworks to share information on urban EbA across sectors. For example, the SCCF-financed project will promote through existing regional networks – such as REGATTA, the CCCCC and the Global Adaptation Network (GAN).). Moreover, EbA will be included into national climate change strategies in El Salvador and Mexico. By sharing the lessons learned on urban EbA through existing frameworks, the promotion of urban EbA is expected to continue after the end of the project.

342. Sustainability will also be supported by the technical training of national and sub-national authorities, the private sector and local communities on urban EbA in San Salvador, Kingston and Xalapa. This training will include development of: i) technical guidelines to plan, implement and monitor urban EbA; ii) best practice manuals on upscaling urban EbA; and iii) a roadmap for integrating urban EbA into medium- to long-term urban development planning of the municipalities of the pilot cities. At the local level, training will include the development of protocols and the implementation of urban EbA interventions at three scales. In addition, a workshop or other forms of participatory consultations will be held to promote climate-resilient urban livelihoods. Through the implementation of these project interventions, local government will be mobilised to: i) implement urban EbA in the selected medium-sized cities; ii) integrate urban EbA into the city development plans; and iii) develop alternative climate-resilient livelihoods²⁰². The on-the-ground activities will provide a proof-of-concept of urban EbA for local government and urban communities. This will promote the maintenance of the activities. Consequently the urban EbA interventions will be sustained beyond the project.

343. Local authorities and community members will be engaged with to actively participate in the development and implementation of the EbA interventions based on their own priorities. Through this learning-by-doing approach, local authorities and community members will learn the necessary skills to implement and maintain the EbA interventions after the project's lifespan. As part of the approach, systems will be developed for the maintenance of the interventions. This will include: i) sustainable financing mechanisms that can support ongoing maintenance and implementation of EbA interventions; ii) local community members taking formal responsibility for maintaining the various aspects of the EbA interventions; and iii) guidelines on monitoring and reporting any maintenance requirements. In addition, the involvement of local government with the implementation of EbA interventions will provide them with the technical knowledge necessary to support and maintain the interventions. Moreover, the mainstreaming of urban EbA into policies, strategies and plans is expected to lead to integration of EbA into budget and planning

²⁰² Examples of climate-resilient livelihoods include: urban agriculture and bee-keeping.

processes. This will result in regular budget allocations by local government for the implementation, maintenance and upscaling of the EbA interventions beyond the project lifespan. The strategies developed under Output 1.4 will also contribute to ongoing maintenance and sustainability of the project interventions, particularly through the establishment of sustainable financing mechanisms involving private sector stakeholders.

344. The sustainability of the project will be further supported through an awareness raising campaign on climate change and the benefits of urban EbA. Through awareness raising—particularly at young age – it is more likely that people will remember EbA as an option to adapt to climate change at a later point in time. For example, in Mexico the urban EbA approach will be integrated into the existing national educational and communication strategy on climate change. Information will be communicated through a variety of media such as radio, webinars, social media and local newspapers. Monitoring and research conducted by the project (e.g. Output 3.3) will also provide a knowledge base on the social, economic and environmental benefits of urban EbA in the three pilot cities. Research results will be disseminated through the publication of peer-reviewed papers. National research institutions that will play a role in this work include the University of El Salvador in San Salvador, the University of the West Indies in Kingston and the Ecological Institute in Xalapa. The availability of quantitative information on the benefits of urban EbA will promote evidence-based decision-making by the local authorities in the future, thereby promoting EbA investments beyond the project's endpoint.

3.9. Replication

345. The SCCF-financed project will implement urban EbA interventions at three selected sites in three medium-sized cities in El Salvador, Jamaica and Mexico. Urbanisation and increased rainfall over a shorter period is predicted for most cities in the LAC region (see Section 2.1). As such, the three selected pilot cities provide appropriate examples for replication across the LAC region. With increased urbanisation rates, the provision of ecosystem services – from urban and peri-urban ecosystems – becomes increasingly important to support urban communities to adapt to the effects of climate change. Therefore, the protocols and guidelines within this project will be tailored to enhance these ecosystem services. In addition, the protocols, technical guidelines and lessons learned will be documented to facilitate replication in other cities in the country and the LAC region.

346. To promote the replication of urban EbA at national level, an upscaling strategy will be developed under Output 1.4. This will include the strengthening of local financing mechanisms to fund urban EbA interventions. The upscaling strategy will be supported by the revision of existing climate change and environmental strategies, policies and plans to integrate urban EbA. As a result of this improved institutional framework, urban EbA interventions will be integrated into local urban development plans, implemented and replicated on-the-ground. During the implementation of this pilot project, local authorities in the three cities will acquire increased knowledge and skills while developing a degree of ownership of the project. As a result, relevant government departments will have increased capacity to replicate the urban EbA interventions in other neighbourhoods within each city. Replicating the EbA interventions will support implementation of the revised local environmental plans and strategies as well as the sustainability of the project interventions. In addition, due to the geographical scope of work of national research institutes and universities, they will be targeted as stakeholders to promote upscaling of the urban EbA interventions in other cities within each country. Lastly, regional websites – such as

REGATTA and the C40 cities – will facilitate the sharing of information between national and local governments, as well as NGOs and community leaders between cities across the LAC region. Consequently, the sharing of information will promote the replication and upscaling of EbA activities beyond the project's intervention areas and implementation phase.

347. Through the improved cross-sectoral coordination between research institutions, private sector and government departments, the knowledge base on urban EbA will be expanded. This expansion is supported by the research undertaken under Outcome 3.3, which will provide information on best practices of urban EbA in the pilot sites. In addition, through research, locally appropriate and cost-effective approaches to implement urban EbA will be identified. Moreover, best practices and on-the-ground demonstrations on the benefits of urban EbA will promote the replication of the interventions and the upscaling of activities beyond the project's intervention areas.

3.10. Public awareness, communications and mainstreaming strategy

348. National and local governments as well as urban communities in El Salvador, Jamaica and Mexico have limited knowledge on using urban EbA to adapt to the effects of climate change. To address this limitation, the SCCF-financed project will develop a communication strategy on urban EbA for each of the three pilot cities. As part of this strategy, a public awareness campaign will be held to explain: i) the EbA approach with a focus on urban EbA; ii) how urban EbA can be used to adapt to the effects of climate change; iii) the development of climate-resilient livelihoods using urban EbA; and iv) basic urban EbA tools and technical guidelines that can be used to implement this approach. In addition, lessons learned and information generated during the project implementation will be integrated into the awareness campaign.

349. The SCCF-financed project will use existing media networks to implement the public awareness campaigns. In San Salvador this will include: i) a local radio station (Radio Nacional de El Salvador); ii) local newspapers (prensa gráfica or colatino); and iii) Tv (Channel 10). For Kingston, this will include: i) The GoJ-Jamaica Information Service²⁰³ (JIS) and Public Broadcasting Corporation; ii) television and newspapers (Television Jamaica and The Observer). For Xalapa this will include: i) Radio-Television Veracruz (State); and ii) Radio / TV depending on the Universidad Veracruzana. Additionally, the project will develop short videos on the implementation process of the interventions and webinars to allow online teaching. For learners at primary, secondary and high schools, appropriate awareness raising activities on climate change and EbA will be identified and developed.

350. The project will facilitate the mainstreaming of the urban EbA approach into relevant policies and national development plans by: i) recommending revisions to existing policies and strategies; and ii) developing a strategy to upscale the activities and mobilise funds to implement urban EbA at a larger scale and/or in other cities. In addition, in each of the three pilot cities, a road map for medium-to long-term planning will be developed to include urban EbA in urban development planning and the vision 2030 plan in Kingston. Next, the project will use existing frameworks in the pilot countries and cities to disseminate information on urban EbA. For example, in El Salvador, collaboration will be sought with the inter-ministerial

²⁰³ The Office of the Prime Minister is responsible for the portfolio of Information and this Office is responsible for the dissemination and management of all information and media related material emitted from the government ministries, especially from the Office of the Prime Minister.

committee on climate change for the communication of lessons learned on urban EbA. In Jamaica, the CCAC will become a board with a smaller membership to promote cross-sectoral coordination on implementing urban EbA and the Caribbean Community Climate Change Centre will facilitate the sharing of information on climate change adaptation between institutions across the Caribbean. In Mexico, a specific programme will be designed and coordinated by CECADESU, building on previous experiences (“Break with climate change”).

351. At regional level, the knowledge and lessons generated through the pilot project will be disseminated through several regional online networks. For example i) the REGATTA website; ii) the C40 cities Latin American Mayors group²⁰⁴; iii) the web-based database of the Caribbean Regional Framework; and iv) the EbA flagship. These websites will facilitate the sharing of climate change information between national and local governments as well as NGOs and urban community representatives between cities across the LAC region. This sharing of information will promote the replication and upscaling of EbA activities beyond the project’s intervention areas and implementation phase.

3.11. Environmental and social safeguards

352. The UNEP checklist for Environment and Social Safeguards (Appendix 18) reflects the positive environmental and social impacts of the project. The regional unit, the PM and UNEP Task Manager (TM) will be responsible for overseeing adherence to these guidelines throughout the implementation of the project.

353. The interventions implemented by the project will have positive environmental effects. These include: i) reduced flooding within the city through water storage, infiltration and harvesting techniques; ii) reduced soil erosion and water run-off from peri-urban watersheds; iii) improved water quality through ecological sanitation; iv) increased climate resilience of urban communities through the promotion and development of additional livelihoods. The activities are designed to improve the environmental conditions in the short-to long-term. However, rapid environmental assessments will be undertaken under Output 2.2 to ensure that no environmental or social negative impacts are expected from project activities. If any concerns arise, a full EIA will be undertaken.

354. The SCCF-financed project will promote gender equity, women’s rights and the empowerment of women in all the project activities. The project will therefore support and align with the gender policies and strategies of each pilot country (see Section 3.1). In addition, the project will emphasise the involvement of particularly vulnerable community groups, such as youth and women-headed households. These groups will be targeted for the awareness raising campaign and training as well as the promotion of climate-resilient livelihoods.

SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS

355. The SCCF-financed project will be implemented over a four-year period from 2016 to 2020 (see work plan Appendix 7). The project will be executed by UNEP-ROLAC in coordination with the MARN (El Salvador), MWLECC (Jamaica) and SEMARNAT (Mexico) and in collaboration with other relevant ministries.

²⁰⁴ <http://www.c40.org/about>. Accessed on 30 March 2015.

356. National inter-ministerial committees in each country will be consulted wherever possible. In addition, there will be consultation with local level stakeholders throughout project implementation to ensure that local-level priorities are included in the implementation of project activities. It should be noted that in Jamaica and El Salvador, national and local governments are closely linked as the pilot cities chosen are capital cities. Consequently, interactions between the national and local levels will be easily facilitated through meetings and workshops as needed. In El Salvador, the project will consult with representatives of the Municipality of District Five, as well as the Council of Mayors of the Metropolitan Area of San Salvador, as necessary. In Jamaica, consultations will include representatives from the Kingston and St. Andrew Corporation. Where as in Mexico, there is one level in between local and national government, namely the state. The state government is seated in Xalapa and as a result the stakeholders of the project will work closely with the representatives of the state government.

357. In general, responsibilities in the delivery of outputs under Outcomes 1 and 3 will largely rely on UNEP-ROLAC, while the delivery of outputs under Outcome 2 will be a joint responsibility between UNEP-ROLAC and the above-mentioned partner government institutions (see specific arrangements below). Implementation of the SCCF-financed project will be informed by lessons learned from ongoing activities on adaptation to climate change and EbA projects in the LAC region (see Section 2.7). During the first phase of the project, an inception workshop will be held to inform stakeholders about the project work plan, the roles of each stakeholder during the implementation phase and the first steps to commence the activities. As part of an adaptive management approach, intensive consultation with local stakeholders (see Section 2.5) will be undertaken to validate the intervention activities of the project. Thereafter, a baseline study will be undertaken in the selected sites in each pilot city to refine and validate the project's Results Framework (see Appendix 6) including amending the indicators if necessary and measuring their baseline values.

358. UNEP will be the Implementing Agency (IA) for the SCCF-financed project. It will oversee the project and provide the technical assistance required to meet the project goal. Details of UNEP's comparative advantage are provided in Appendix 19 of the Project Document. A Task Manager (TM) – based in UNEP's Department of Environmental Policy Implementation (DEPI/GEF) Climate Change Adaptation Unit (CCAU) – will be responsible for project supervision to ensure consistency with GEF and UNEP policies and procedures. The TM will formally participate in the following: i) Annual Project Steering Committee (PSC) meetings; ii) the mid-term and final evaluations; iii) the clearance of Bi-annual Progress Reports and Project Implementation Reviews; and iv) the technical review of project outputs.

Management structure

359. The management structure of the project is presented in Figure 6. This structure comprises: i) the PSC; ii) the National Coordination Unit (NCU); and iii) the Regional Support Unit, including an M&E expert and National and International experts. The roles of each of the positions and units are described in Appendix 10

360. The PSC will be responsible for taking management-related and technical decisions for the project. The mandate of the PSC will include: i) providing guidance and direction for project implementation; and ii) reviewing and approving reports and Annual Work Plans (AWPs), including any changes to the Results-Based Framework (RBF) or timeline of project activities. All decisions to be taken by the PSC will be communicated to the concerned parties by the Member Secretary. The PSC will meet twice a year to discuss performance

indicators and provide strategic guidance. In addition, the PSC will ensure that the necessary resources are committed, and will arbitrate on any conflicts within the project or negotiate a solution to any problems between the project and external bodies. Furthermore, the PSC will approve the responsibilities of the Regional Coordinator (RC).

361. To facilitate coordination between the stakeholders of the SCCF-financed project, three National Coordination Units (NCUs) will be established in El Salvador, Jamaica and Mexico, respectively. A full time National Coordinator (NC) will be recruited for the NCU in each of the three countries to lead the implementation of local project activities and deliverables. The NC will: i) report to the RC; ii) manage the country level activities in line with the budget, work plans, and in accordance with GEF and UNEP guidelines; iii) be responsible for in-country financial management and disbursements, with accountability to the government and UNEP; and iv) work closely with national and local authorities, as well as NGOs, to manage the project effectively at a local level. To achieve this, the NC will *inter alia*: i) provide on-the-ground information for UNEP progress reports; ii) engage with project stakeholders; iii) arrange the PSC, NCU and other meetings; iv) provide technical support to the project, including measures to address challenges to project implementation; and v) participate in training activities, report writing and facilitation of expert activities that are relevant to the NC's area of expertise. Moreover, the NC will serve as a liaison among the NCUs, the technical experts and the government staff involved in project activities.

362. Within the NCU, the NC will be supported by a finance consultant who will be located within the executive ministry. As part of the NCU, a committee will be established comprised of academics, representatives from NGOs, CBOs and other experts to provide advice when necessary when implementing the project interventions.

363. A part-time regional M&E specialist will be recruited whose duties will include: i) establishing a performance monitoring framework for the three countries to define bi-annual targets for the project to meet the targets defined in the project document by the end of the implementation phase; ii) measuring the indicators to evaluate the progress of the project in meeting the targets; iii) reporting to the NCUs of each country and PSC on the performance of the project according to project and AMAT indicators; and iv) supporting the RC and NCs in meeting the project objective. As part of his/her responsibilities, the M&E specialist will ensure gender is adequately addressed throughout the project and will oversee and monitor the application of gender disaggregated indicators.

364. A Regional Support Unit will be established to: i) promote dialogue between the NCUs; ii) facilitate coordination of the project throughout the LAC region; and iii) strengthen collaboration with existing projects and initiatives in each country and the region. The NCUs will have monthly coordination e-meetings with the Regional Support Unit and a joint e-meeting every three months. Physical meetings will take place at least once a year. During these meetings the RSU and NCUs will receive updates, share experiences on urban EbA and provide recommendations, if necessary, to improve interventions. The Regional Support Unit will be led by the Regional Coordinator (RC).

365. The RC will provide overall operational management for the successful execution and implementation of the project. This will include the part-time responsibility to manage, coordinate and supervise the NCUs on the implementation of the project and the delivery of results in accordance with the project document and agreed work plans. Furthermore, the RC will supervise the NCs and report to the PSC.

366. The Administration and Finance Officer (AFO) within the Regional Support Unit will ensure that all financial and administrative issues are carried out according to UNEP standard procedures. He/she will make all the necessary administrative steps and financial transactions for project outputs and activities to be delivered according to the established work plan. The AFO will assist the RC and the UNEP TM in all project reporting requirements and will report to the RC.

367. As part of the NCU, a technical committee will be established comprised of academics, representatives from NGOs, CBOs and other experts. In addition, to provide technical support, national and international experts will be hired for specific tasks that cannot be undertaken by government staff. International technical assistance will be sourced for specialist tasks only where existing national capacity is insufficient. Appropriate international expertise will be sourced with the assistance of UNEP's systems for procurement of consulting services in participation with the NC. Descriptions of consulting services required are included in the budget notes of Appendix 4. ToRs for project staff are presented in Appendix 13. Further details of the roles of the committees and units will be determined during the project inception phase.

Specific arrangements

San Salvador

368. The MARN and the MOP are identifying a collaboration agreement to set clear responsibilities. Because of the difficulties in creating budget space within the structure of the Ministry of Finance, the MARN and MOP proposed to have a supervisory role and entrust UNEP-ROLAC with the execution of Component 2 in San Salvador (please refer to the letter of request in Appendix 22). A Memorandum of Understanding (MoU) between UNEP-ROLAC and the MARN – possibly also the MOP – will be signed to establish the collaboration framework. UNEP-ROLAC will establish one or several project cooperation agreements to ensure that the proposed on-the ground activities are carried out according to the terms agreed with the MARN (in the MoU). All additional executing partners will undergo standard UNEP due diligence procedures. Representatives of MARN will have a decisive role in all procedures relating to executing partners, procurement, human resources or other related services to execute Component 2. Executing partners will ensure ongoing communication and coordination with both government counterparts and UNEP-ROLAC. The NC will be provided with office space in MARN, MOP or the external executing partner (as established in the MoU). The position of Finance Assistant will be filled by the Administration and Finance Officer based in Panama.

369. Although project execution is under the auspices of the MARN and MOP as national government authorities, local government representatives from these authorities in San Salvador will be the main responsible for implementing activities under Outcome 1 and 3 and maintenance of EbA interventions beyond the project lifetime. Because San Salvador is the capital city, there will be close collaboration between local and national government representatives of MARN and MOP through regular meetings and joint attendance to training workshops.

Kingston

370. In Jamaica, the MWLECC has entrusted UNEP-ROLAC with the execution of Component 2 in Kingston as a result of limited human resource capacity and complications in making budget space available to receive funds (See Appendix 22). An MoU between UNEP-ROLAC and the MWLECC will be signed to set the collaboration framework. UNEP-

ROLAC will establish one or several project cooperation agreements to ensure that the proposed on-the ground activities are carried out according to the terms agreed with the MWLECC in the MoU. MWLECC will act in a technical supervisory role to oversee processes on behalf of Government of Jamaica. The Jamaican Focal Point and Climate Change Division – acting on behalf of MWLECC – will be involved in all the decision making processes related to the implementation of the project generally and the Jamaican component in particular. All additional executing partners will undergo standard UNEP due diligence procedures. Representatives of the MWLECC will have a decisive role in all procedures relating to executing partners, procurement, human resources or other related services to execute Component 2. Executing partners will ensure ongoing communication and coordination with government counterparts and UNEP-ROLAC. The NC will have an office space in either the MWLECC or the external executing partner (as established in the MoU). The position of Finance Assistant will be filled by the Administration and Finance Officer based in Panama. UNEP-ROLAC and the chosen executing partners will furnish the MWLECC with the required reports to the Ministry of Finance on the collaboration.

371. Although project execution is under the supervision of the MWLECC as national government authority, local government representatives from these authorities in Kingston will be the main responsible for implementing activities under Outcome 1 and 3 and maintenance of EbA interventions beyond the project lifetime. Because Kingston is the capital city, there will be close collaboration between local and national government representatives of MWLECC through regular meetings and joint attendance to training workshops.

Xalapa

372. SEMARNAT and the Municipality of Xalapa have identified Fondo Golfo de México (FGM) – a subsidiary of the Fondo Mexicano para la Conservación de la Naturaleza (FMCN) – as the preferred executing partner (refer to Appendix 22). The FMCN has solid experience in executing GEF and World Bank projects, with in-house technical and financial capacity. FGM/FMCN is therefore an adequate partner for execution of Component 2 in Xalapa. In addition, UNEP-ROLAC will establish a Project Cooperation Agreement with FGM/FMCN to: i) set up clear responsibilities for delivery of the proposed activities; ii) determine funds required; and iii) establish supervisory roles. SEMARNAT and the Municipality of Xalapa will have a decisive role in the agreement and a supervisory role in the deliverables of the executing partner. The NC and financial assistant will be contracted by the executing partner under supervision by UNEP-ROLAC, SEMARNAT and the Municipality of Xalapa and they will seek constant communication and coordination with the above-mentioned partners.

373. In Xalapa, project implementation will be undertaken in close collaboration with SEMARNAT at state level and the municipality of Xalapa at local level. The municipality of Xalapa will mainly be responsible for maintaining Eba interventions beyond the project lifetime. SEMARNAT, as intermediate between local and national level, will be responsible for communicating progress on EbA interventions in Xalapa to representatives of SEMARNAT at national level and will be facilitating the upscaling of the interventions at state and national scale.

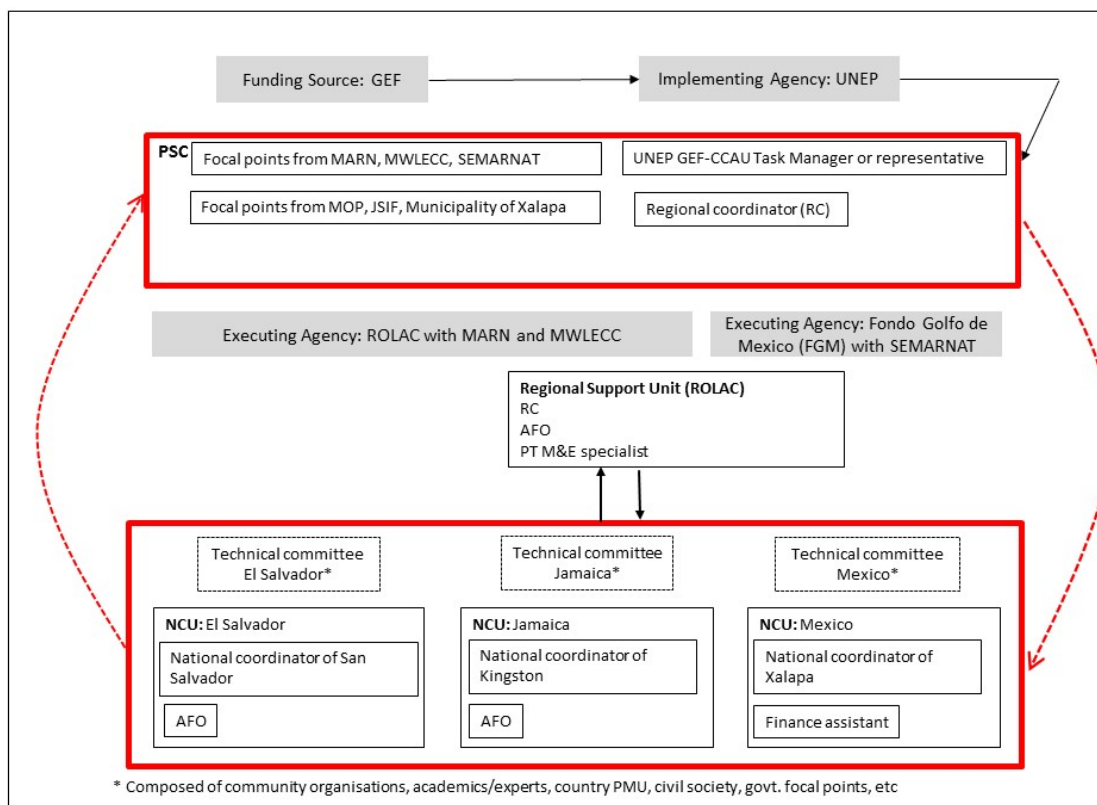


Figure 6. Organogram of the project management structure.

SECTION 5: STAKEHOLDER PARTICIPATION

374. The PPG phase included extensive stakeholder consultation, which is elaborated further in Appendices 17 and 21. The implementation phase of the SCCF-financed project will rely on the participation of a wide range of stakeholders. Consequently, the project will create active partnerships at the regional, national and local level with NGOs, private sector partners and relevant ongoing initiatives and projects in the pilot cities. In addition, national and international research institutions will be involved in the implementation and maintenance of scientific research projects to inform the design and implementation of the urban EbA interventions. In particular, these research institutions will contribute to assessing and monitoring the long-term social, economic and environmental benefits of these interventions. At the local level, representatives of urban communities will participate in the decision-making process to design, implement and monitor the on-the-ground interventions. Community participation will be further supported by communicating with the public in a consistent, supportive and effective manner. This process will promote an understanding and ownership of the project's interventions by local communities.

375. The process for stakeholder consultations during the implementation phase will include: i) initial meetings with national and sub-national government authorities – the MARN, MWLECC and SEMARNAT – and communal authorities during the inception workshop (see Section 2.5); ii) consultations with the coordinators of the baseline and partner projects (see Section 2.6); iii) consultations with the aligned projects (see Section 2.7); iv) consultations with NGOs, local associations and cooperatives; and v) consultations with other members of local communities that will benefit from the project.

376. The role of relevant stakeholders and their partners during the implementation phase of the project are presented in Table 9 below. MoUs will be signed between the implementing ministry and the relevant government institutions participating in the implementation of the project.

Table 9. List of stakeholder responsibilities per Output and Activity.

Output	Activity	Lead coordination	Important stakeholders	Main responsibility
Output 1.1 Policy briefs developed on the recommended revisions to policies, strategies and plans, including budget allocations to integrate urban EbA at national and sub-national scales.	1.1.1	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico)	<ul style="list-style-type: none"> Undertaking gap analyses and mapping exercises. Collating and synthesising urban EbA information and planning tools.
	1.1.2	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico)	Overseeing the revisions to the existing plans and strategies to include (urban) EbA.
	1.1.3	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico), MoF	Coordinating workshops to communicate findings and strategies to policy- and decision-makers on the following topics: i) entry points for urban EbA; ii) an upscaling strategy; and iii) national budget allocations for urban sectors to integrate urban EbA at local and national scales.
Output 1.2 A framework developed for sharing technical information on urban EbA to promote government, private sector and community action to implement EbA interventions in urban areas.	1.2.1	ROLAC	<ul style="list-style-type: none"> MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico) NCU National Experts 	Overseeing: <ul style="list-style-type: none"> meetings between national experts and projects already conducting research on policies and strategies for producing technical guidelines that promote urban EbA;
	1.2.2	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico)	<ul style="list-style-type: none"> review of relevant strategies and policies to identify where technical guidelines on EbA are needed; and the development of technical guidelines that promote adaptation to climate change using EbA.
Output 1.3 Training provided for local and sub-national government in pilot	1.3.1	ROLAC	MARN (El Salvador), MWLECC (Jamaica),	Coordinating training activities, including: <ul style="list-style-type: none"> inviting participants from

cities trained on the effects of climate change and urban EbA.			Municipality of Xalapa (Mexico)	<ul style="list-style-type: none"> relevant government departments; and providing input for the training of the trainer (TOT) material.
	1.3.2	ROLAC	MARN (El Salvador), MWLECC (Jamaica), Municipality of Xalapa (Mexico)	
Output 1.4 A strategy developed to upscale and sustain EbA interventions through strengthening of local financial mechanisms to fund EbA actions.	1.4.1	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C, Municipality of Xalapa (Mexico)	Overseeing: <ul style="list-style-type: none"> workshops/meetings between experts and the Ministries of Finance of the three countries; the development of a national upscaling strategy; the development of a financing plan; the design of the roadmaps at municipal level; the development of manuals; and the process to identify potential sites for replication.
	1.4.2	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT, Municipality of Xalapa (Mexico)	
	1.4.3	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C, Municipality of Xalapa (Mexico)	
	1.4.4	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C, Municipality of Xalapa (Mexico) MOF (all three countries)	
	1.4.5	ROLAC	MARN (El Salvador)	
Output 2.1: Assessments of climate change hazards and adaptation needs as well as scenario maps of resource availability produced in each pilot city, which will guide effective implementation of EbA interventions.	2.1.1	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT (Mexico)	National experts	Overseeing: <ul style="list-style-type: none"> the development of the climate hazard and socio-economic assessments; the development and dissemination of policy briefs; the identification and analysis of social and climate-related factors; and the development of the scenario maps.
	2.1.2	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT (Mexico)	National Policy expert	
		MARN (El Salvador), MWLECC	NCU and experts	

		(Jamaica), SEMARNAT (Mexico)		
		GIS unit	NCU	
	2.2.2	GIS unit	NCU	
Output 2.2: Protocols for city-specific implementation of urban EbA interventions, developed in consultation with stakeholders.	2.2.1	ROLAC (for El Salvador), ROLAC (for Jamaica), SEMARNAT, Municipality of Xalapa (Mexico)	MARN, NCU, MOP (El Salvador); MWLECC (Jamaica)	Developing protocols for urban EbA interventions.
	2.2.2	ROLAC (for El Salvador), ROLAC (for Jamaica), SEMARNAT Municipality of Xalapa, (Mexico)	MARN, MWLECC NCU	Overseeing workshops/ meetings between experts and representatives from the relevant ministries.
Output 2.3 Relevant urban EbA interventions implemented within pilot cities at household, urban landscape and urban catchment level (upstream and downstream from the pilot cities).	2.3.1	ROLAC	MARN, MOP Community groups, Women groups, (El Salvador)	Coordinating the implementation of the urban EbA interventions in the Arenal-Monserrat area in San Salvador.
	2.3.2	ROLAC	MWLECC, Community groups, Women groups	Coordinating the implementation of the urban EbA interventions in the Hope watershed in Kingston.
	2.3.3	Fondo Golfo de México (FGM)	Community groups, Women groups, SEMARNAT, Municipality of Xalapa (Mexico)	Coordinating the implementation of the urban EbA interventions in the Carneros watershed in Xalapa.
Output 2.4 Additional climate-resilient livelihoods developed and promoted through training and demonstration plots.	2.4.1	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT, (Mexico)	ROLAC, Women groups, Municipality of Xalapa	Coordinating the development and implementation of a community strategy for climate-resilient livelihoods.
	2.4.2	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT (Mexico)	ROLAC, Women groups, MINED and MAG (El Salvador) Municipality of Xalapa (Mexico)	
Output 3.1: Communication strategy developed to collect and disseminate knowledge on best-	3.1.1	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/I NECC	Communication departments of relevant ministries	Overseeing: <ul style="list-style-type: none"> the development and implementation of the communication strategy.

practice urban EbA.		(Mexico)		
	3.1.2	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INECC (Mexico)	Communication departments of relevant ministries.	<p>Coordinating:</p> <ul style="list-style-type: none"> the design and implementation of a web-based platform for sharing information collated and generated by the SCCF-financed project; and awareness raising activities for the website. <p>Overseeing the development of the web-based platform.</p>
	3.1.3	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INECC (Mexico)	Overseeing the coordination of the cross-sectoral committees.
Output 3.2 Public awareness communication materials for each phase of the project, shared with decision-makers, community members and identified stakeholders.	3.2.1	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT, Municipality of Xalapa (Mexico), Ministry of Education	Coordinating the appropriate use of communication tools for the public awareness campaign.
Output 3.3 A long-term research programme, with an emphasis on cost-benefit analyses, on the impacts of urban EbA interventions in pilot cities.	3.3.1	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INECC (Mexico). Universities and National Research institutions	Coordinating workshops with representatives of climate change and research institutions to identify gaps in existing data.
	3.3.2	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INECC (Mexico), Universities and National Research institutions	<ul style="list-style-type: none"> Overseeing the design and development of a LTRP to monitor the effects of the implemented interventions; and Coordinating the monitoring of EbA interventions.
	3.3.3	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INECC (Mexico), Universities and	Coordinating the dissemination of research results with the regional committee and other regional networks.

			National Research institutions	
	3.3.4	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico), Universities and National Research institutions	Selecting: <ul style="list-style-type: none"> • urban EbA topics for MSc and PhD theses; and • funding for students.
	3.3.5	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT/INEC C (Mexico), Universities and National Research institutions)	Assisting and encouraging students to publish the findings of their research in peer reviewed papers.
Output 3.4 Educational toolkits detailing lessons learned and good EbA practices disseminated to local, sub-national, national and regional authorities.	3.4.1	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT, Municipality of Xalapa (Mexico), NCU	Overseeing the development of educational toolkits on climate change and urban EbA.
	3.4.2	ROLAC	MARN (El Salvador), MWLECC (Jamaica), SEMARNAT, Municipality of Xalapa (Mexico), NCU Departments of education, schoolboards (All countries)	Providing input and validating the developed educational toolkits.
Output 3.5 Knowledge generated by the SCCF-financed project, including lessons learned, available through a web-based portal within the REGATTA network.	3.5.1	ROLAC	NCU, GAN, REGATTA	Overseeing the coordination of all information-sharing on urban EbA within the REGATTA network.
	3.5.2	ROLAC	NCU, GAN, REGATTA	
	3.5.3	ROLAC	NCU, GAN, REGATTA	

SECTION 6: MONITORING AND EVALUATION PLAN

377. The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in

Appendix 10. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

378. The Monitoring and Evaluation (M&E) plan is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 6 includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Appendix 8 will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarised in Appendix 9. Other M&E related costs are also presented in the costed M&E Plan and are fully integrated in the overall project budget.

379. The M&E expert will be collecting and reporting on the progress towards the outcomes and report to the Regional Coordinator. He/she will review or revise the M&E plan as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the inception workshop. Day-to-day project monitoring is the responsibility of the regional coordinator and national coordinators but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Regional Coordinator in ROLAC to inform the TM in UNEP DEPI of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

380. The PSC will receive periodic reports on progress and will make recommendations to UNEP on the need to revise any aspects of the Results Framework or the M&E plan. The TM is responsible for project oversight to ensure that the project meets UNEP and GEF policies and procedures. The TM will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

381. Project supervision will take an adaptive management approach. The TM will develop a project supervision plan at the inception of the project, which will be communicated to the project partners during the inception workshop. The emphasis of the TM supervision will be on outcome monitoring but will also include responsibility for the project's financial management and monitoring of implementation. Progress regarding the delivery of the agreed project benefits will be assessed with the Steering Committee at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

382. As indicated in the project milestones, a mid-term management review or evaluation will take place in year two. The purpose of the Mid-Term Review (MTR) or Mid-Term Evaluation (MTE) is to: i) provide an independent assessment of project performance at mid-term; ii) determine whether the project is on track and whether any challenges are impeding progress; and iii) decide on the corrective actions required for the project to achieve its intended outcomes by project completion in the most efficient and sustainable way. The review will include all parameters recommended by the GEF Evaluation Office for terminal evaluations and will verify information gathered through the GEF tracking tools, as relevant.

The project Steering Committee will participate in the mid-term review and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented. The MTR will be managed by the UNEP Task Manager at DEPI. The MTE will be managed by the Evaluation Office of UNEP. The Evaluation Office will determine whether a MTE is required or whether an MTR is sufficient.

383. An independent terminal evaluation (TE) will take place at the end of project implementation. The Evaluation office (EO) of UNEP will manage the terminal evaluation process. The TE will provide an independent assessment of project performance – in terms of relevance, effectiveness and efficiency – and determine the likelihood of impact and sustainability. It will have two primary purposes: i) to provide evidence of results to meet accountability requirements, and ii) to promote learning, feedback, and knowledge-sharing through results and lessons learned among UNEP and executing partners (MARN, MWLECC and SEMARNAT in particular). The direct costs of the evaluation will be charged against the project evaluation budget. The TE report will be sent to project stakeholders for comments. Formal comments on the report will be shared by the Evaluation Office in an open and transparent manner. The project performance will be assessed against standard evaluation criteria using a six-point rating system. The final determination of project ratings will be made by the Evaluation Office when the report is finalised. The evaluation report will be publically disclosed and will be followed by a recommendation compliance process.

384. The GEF tracking tools are attached as Appendix 15. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tools.

SECTION 7: PROJECT FINANCING AND BUDGET

7.1. Overall project budget

Table 10. A breakdown of total project financing.

	SCCF Funds	Co-Financing	Total Costs
Total project cost (US\$)	6,000,000	29,734,000	35,734,000

7.2. Project co-financing

385. Co-financing will be provided by the following partners and per the co-financing letters in Appendix 14.

Table 11. A breakdown of the total co-financing for the project.

	US\$	%
SCCF Funds	6,000,000	16,9
Co-financing		
National government El Salvador (MOP)	21,986,000	61,5
Jamaica Social Investment Fund (JSIF)	4,000,000	11,2
CONAGUA	3,120,000	8,8
United Nations Environment Programme	628,000	1.8
Total	35,734,000	100

7.3. Project cost-effectiveness

386. One of the SCCF requirements is to use a cost-effective approach to climate change adaptation. Therefore, the design of this project includes several measures to promote cost-effective use of SCCF resources. These are described in more detail below.

387. Firstly, the SCCF-financed project will promote the use of EbA combined with hard infrastructure to adapt to climate change. Globally, there is growing interest in the use of ecological infrastructure to increase the resilience of vulnerable communities from the negative effects of climate change and climate-related extreme events. However, there is still limited awareness among national and sub-national governments in the LAC region on the cost-effectiveness of the EbA approach and the wide range of co-benefits that can be generated through this approach. As a result, hard infrastructure – such as dams and concrete pavements– has historically been implemented in this region²⁰⁵. Although hard infrastructure may be effective in addressing short-term problems, it is often expensive to construct. Additionally, such infrastructure often requires considerable maintenance and repair in the medium to long term.

Through the SCCF-financed project, an EbA approach will be promoted to enhance ecosystem functioning of urban and peri-urban ecosystems at watershed, urban landscape and household scale. This is a cost-effective and low-risk approach to managing water supplies for downstream cities²⁰⁶.

388. The cost-effectiveness of watershed conservation is variable depending on the local context. In particular, the costs for watershed conservation are dependent on the size of the area within which the activities will be implemented and the population density in the watershed. The most appropriate and cost-effective approaches will therefore differ widely between cities. For example, results from a global assessment of five different watershed conservation activities²⁰⁷ showed that conservation agriculture – e.g. no tillage – is the most cost-effective approach to improving water quality and quantity for downstream users²⁰⁸. Similarly, a modelling study undertaken in Costa Rica's Reventazón watershed showed that soil conservation practices in the upper watershed areas reduced erosion by ~97%. This decrease in soil erosion resulted in an annual cost saving of ~US\$1 million to the hydropower company, which would normally be used to remove sediment out of the hydropower dam²⁰⁹.

389. In coastal areas in the Caribbean, seawalls, breakwaters and other forms of protection are constructed to replace natural reefs. Such infrastructure costs between US\$1.6–2.7 billion to construct. In contrast, conserving reefs to prevent on-going degradation from

²⁰⁵ Sutton-Grier, A.E., et al. 2015. Future of our coasts: The potential of natural and hybrid infrastructure to enhance the resilience of our coastal communities, economies and ecosystems. *Environmental Science & Policy*. 51: 137-148.

²⁰⁶ McDonald, R.I. and Shemie, D. 2014. Urban Water Blueprint: Mapping conservation solutions to the global water challenge. The Nature Conservancy. Washington, D.C.

²⁰⁷ These activities include: forest protection, reforestation, agricultural best management practices, riparian restoration and forest fuel reduction.

²⁰⁸ McDonald, R.I. and D. Shemie. 2014. Urban Water Blueprint: Mapping conservation solutions to the global water challenge. The Nature Conservancy: Washington, D.C.

²⁰⁹ Bovarnik et al. 2010. The Importance of Biodiversity and Ecosystems in Economic Growth and Equity in Latin America and the Caribbean: An economic valuation of ecosystems. United Nations Development Programme.

overfishing or coral mining – through establishment of marine protected areas – would cost US\$34 million in start-up and US\$47 million annually to maintain. Conservation of these ecosystems is therefore a cost-effective and low-risk approach to protecting coastal communities and assets from the effects of climate change including: i) more frequent and severe storm surges; and ii) beach erosion. Additionally, this investment could generate an extra US\$10 billion per year in co-benefits to coastal economic sectors such as sustainable tourism and fisheries. Table 13 below provides two more examples of the cost effectiveness of EbA²¹⁰.

Table 12. Examples of the costs of EbA compared with hard infrastructure to adapt to the effects of climate change.

EbA for adaptation to climate change	Hard infrastructure for adaptation to climate change
<i>Sustainable water management</i>	
In Bogota, Colombia, the paramo wetland ecosystem filters out contaminants and captures sediments in such an efficient way that water delivered to the city's treatment plant only needs chlorine treatment for disinfection. This services saves the city US\$19.6 million in avoided water filtration facilities.	The cost of building a water reservoir to store water until 2023 to supply the municipalities of Floridablanca and Bucaramanga in Colombia is estimated at US\$127 million.
Approximately 9 million New York City residents receive 1.3 billion gallons of water per day – 90% of their water requirement – from the Catskill-Delaware watershed. Protection of the watershed has cost the city US\$ 150 million per annum over the past 10 years.	To address the water needs of New Yorkers without this type of natural watershed, a water filtration plant would need to be built. A water filtration plant capable of processing 1.3 billion gallons of water for New York City would cost between US\$ 6–8 billion. In addition, the plant would have operating costs of US\$ 300 million per annum.

390. Through the SCCF-financed project, a combination of hard infrastructure and EbA interventions will be implemented to reduce the vulnerability of urban communities to the effects of climate change. These interventions will include: i) reforestation and the construction of infiltration ditches to enhance ecosystem functioning of watersheds; ii) rehabilitation of urban wetlands; iii) establishment of water storage points in cities; iv) promotion of ecological sanitation; and v) creation of urban gardens. Combining EbA and hard infrastructure will be effective because: i) in the medium and long term, restored ecosystems require fewer maintenance costs than infrastructure; and ii) hard infrastructure – such as water storage points – will improve water availability for communities in the short to medium term²¹¹. Enhancing ecosystem functioning can be regarded as a long-term investment that provides a wide range of sustainable environmental, social and financial benefits. This combination will therefore further contribute to the cost-effectiveness of the project.

²¹⁰ Emerton L, Baig S, Saleem M: Valuing Biodiversity: The Economic Case for Biodiversity Conservation in the Maldives (AEC Project), the Ministry of Housing, Maldives: Transport and Environment Government of Maldives and UNDP; 2009.

²¹¹ Hallegate, S. and Dumas, P. 2009. Adaptation to climate change: soft vs. hard adaptation. C.I.R.E.D. Available at: <http://www.oecd.org/env/cc/40899422.pdf>. Accessed on 1 April 2014.

391. Under Outcome 3 of the SCCF-financed project, a long-term research programme will be developed. The results of the research projects will be made available to the general public through a variety of cost-effective media such as radio, social media and web platforms.

392. The SCCF-financed project will build on the ongoing activities of the regional and national baseline projects. The problems these baseline projects address are related to frequent flooding and the sub-optimal functioning of the waste water and drainage systems. Moreover, activities of these projects do not take into account the current and future effects of climate change – as described in Section 2. Through the SCCF-financed project, an EbA approach will therefore be implemented to complement activities of the baseline projects, thereby improving the functioning of urban ecosystems. This is a cost-effective approach to implementing the SCCF-financed project and will result in: i) increased resilience of urban communities in San Salvador, Kington and Xalapa to the future effects of climate change; and ii) reduced costs as the project will build on the foundations of activities implemented by the baseline project.

Appendices

Appendix 1–3 Background countries

See separate attachment

Appendix 4: Budget by project components and UNEP budget lines

UMOJA Budget

Project title:		Building the resilience of urban communities in the LAC region through ecosystem based adaptation (EbA)											Notes
Project number:													
Project executing partner:		UNEP-ROLAC, MARN, MWLECC and SEMARNAT											
Project implementation period:		Expenditure by project component/activity					Expenditure by calendar year						
From:	2016	Outcome 1	Outcome 2	Outcome 3	PM	M&E	Total	Year 1	Year 2	Year 3	Year 4	Total	
To:	2020												
UNEP Budget Class													
		PERSONNEL COMPONENT											
010		Project personnel											
	1	National coordinator (El Salvador)		200,000			200,000	50,000	50,000	50,000	50,000	200,000	4
	2	National coordinator (Jamaica)		200,000			200,000	50,000	50,000	50,000	50,000	200,000	4
	3	National coordinator (Mexico)		200,000			200,000	50,000	50,000	50,000	50,000	200,000	4
	4	Regional coordinator (48 months @ \$12,000/month)	172,000	36,000	168,000	200,000	576,000	144,000	144,000	144,000	144,000	576,000	1
		Sub-total	172,000	636,000	168,000	200,000	-	1,176,000	294,000	294,000	294,000	294,000	1,176,000
010		Consultants											
	5	International M&E expert		12,000	12,000		24,000	15,000	3,000	3,000	3,000	24,000	2
	6	Adaptation expert	51,000				51,000		12,000	12,000	27,000	51,000	3
	7	Regional Environmental Economics and Finance expert	60,000				60,000			30,000	30,000	60,000	12
	8	Regional Socio-economic expert		65,000			65,000	45,000	20,000			65,000	16
	9	Regional GIS expert		24,000			24,000	24,000				24,000	17
	10	GIS expert (El Salvador)		20,000			20,000	20,000				20,000	18
	11	GIS expert (Jamaica)		20,000			20,000	20,000				20,000	18
	12	GIS expert (Mexico)		20,000			20,000	20,000				20,000	18
	13	Regional Ecological expert		25,000			25,000	25,000				25,000	20
	14	National Agricultural expert (El Salvador)		24,000			24,000		12,000	9,000	3,000	24,000	33
	15	National Agricultural expert (Jamaica)		21,000			21,000		12,000	6,000	3,000	21,000	33
	16	National Agricultural expert (Mexico)		21,000			21,000		12,000	6,000	3,000	21,000	33

	17	National Urban Planning expert (El Salvador)		5,000				5,000		5,000			5,000	24
	18	National Urban Planning expert (Jamaica)		5,000				5,000		5,000	-		5,000	24
	19	National Urban Planning expert (Mexico)		5,000				5,000		5,000	-		5,000	24
	20	Regional Communication expert			75,000			75,000	15,000	15,000	25,000	20,000	75,000	35
	21	Regional Education expert			45,000			45,000	20,000		15,000	10,000	45,000	42
		Sub-total		111,000	267,000	132,000	-	-	510,000	204,000	98,000	106,000	102,000	510,000
010		Administrative Support												
		Administration and Finance Officer (50%)		55,000		45,000		100,000	25,000	25,000	25,000	25,000	100,000	47
		Sub-total		-	55,000	-	45,000	-	100,000	25,000	25,000	25,000	100,000	
160		Travel on official business												
	1	Travel RC to 2 countries and compensation government authorities	8,700					8,700		8,700			8,700	
	2	Travel costs to hold workshops and disseminate technical guidelines in San Salvador, Kingston and Xalapa	11,000					11,000		11,000			11,000	
	3	Travel to countries to provide training on urban EbA	36,000					36,000		12,500	12,500	11,000	36,000	48
	4	Travel for training of trainers workshop	10,950					10,950				10,950	10,950	49
	5	Travel costs for workshop on upscaling strategies	10,950					10,950				10,950	10,950	50
	6	Travel to the countries for socio-economic assessments		20,100				20,100	20,100				20,100	51
	7	Travel to and within the countries for biodiversity assessments		11,700				11,700	11,700				11,700	52
	8	Travel costs for workshop on protocols		10,050				10,050	10,050				10,050	53
	9	Travel costs for workshop on climate-resilient livelihoods		10,950				10,950		10,950			10,950	54
	10	Travel costs to provide training to urban communities and M&E visit		12,300				12,300		5,100	3,600	3,600	12,300	55
	11	Travel costs for a workshop in each pilot city on the communication strategy			12,000			12,000			12,000		12,000	56
	12	Travel costs to pilot the educational toolkits in the three pilot cities			11,450			11,450			11,450		11,450	57
	13	Travel costs to hold a regional workshop			16,400			16,400				16,400	16,400	58
	14	Travel International M&E expert			12,000			12,000		4,000	4,000	4,000	12,000	67
		Sub-total	77,600	64,800	50,850	-	-	193,250	41,850	51,150	43,950	56,300	193,550	

	COMPONENT TOTAL	360,600	1,022,800	350,850	245,000	-	1,979,250	564,850	468,150	468,950	477,300	1,979,250	
	SUB-CONTRACT COMPONENT												
140	Sub-contracts (MOUs/LOAs for cooperating agencies)												
1	With Universities	-	-	-	-	-	-	-	-	-	-	-	-
	Sub-total	-	-	-	-	-	-	-	-	-	-	-	-
140	Sub-contracts (MOUs/LOAs for supporting organizations)												
1	National academics			48,000			48,000	15,000	9,000	9,000	15,000	48,000	39
	Sub-total	-	-	48,000	-	-	48,000	15,000	9,000	9,000	15,000	48,000	
140	Sub-contracts (for commercial purposes)												
1	National Website designer/consultant	-		12,000			12,000				12,000	12,000	37
2	El Salvador-Equipment and EbA interventions	-	966,000				966,000		359,000	361,000	246,000	966,000	25
3	Jamaica-Equipment and EbA interventions	-	881,500				881,500		358,500	274,000	249,000	881,500	27
4	Mexico-Equipment and EbA interventions	-	893,000				893,000		385,000	348,000	160,000	893,000	28
5	El Salvador-Additional livelihoods	-	60,000				60,000		50,000	10,000	-	60,000	30
6	Jamaica-additional livelihoods	-	180,200				180,200		135,500	29,500	15,000	180,200	31
7	Mexico-additional livelihoods		155,000				155,000		80,000	55,000	20,000	155,000	32
8	MSc candidates	-	-	30,000	-	-	30,000		15,000	7,500	7,500	30,000	40
	Sub-total	-	3,135,700	42,000	-	-	3,177,700	-	1,383,200	1,085,000	709,500	3,177,700	
	COMPONENT TOTAL	-	3,135,700	90,000	-	-	3,225,700	15,000	1,392,000	1,094,000	724,500	3,225,700	
	TRAINING COMPONENT												
	Group training												
1	Training on urban EbA (El Salvador)	16,000	-	-	-	-	16,000		6,500	6,500	3,000	16,000	10
2	Training on urban EbA (Jamaica)	16,000					16,000		6,500	6,500	3,000	16,000	10
3	Training on urban EbA (Mexico)	18,000					18,000		7,000	7,000	4,000	18,000	10
4	Training of Trainers workshop	12,000	-	-	-	-	12,000	-			12,000	12,000	11
5	Strengthening drainage master plan El Salvador	48,000					48,000		8,000	32,000	8,000	48,000	15
7	Training for school garden committee and environmental guards (El Salvador)		30,000				30,000		10,000	10,000	10,000	30,000	34
8	Training for urban gardens (Jamaica)		11,000				11,000		4,000	4,000	3,000	11,000	34

9	Training in levee, drain and pond maintenance (Jamaica)		15,000				15,000		5,000	5,000	5,000	15,000	59
10	Training local community and schools (Mexico)		25,000				25,000		10,000	10,000	5,000	25,000	34
11	Workshop costs to present recommended revisions (El Salvador)	1,511					1,511		1,511			1,511	5
12	Workshop costs to present recommended revisions (Jamaica)	1,511					1,511		1,511			1,511	5
13	Workshop costs to present recommended revisions (Mexico)	1,511					1,511		1,511			1,511	5
14	Workshop to disseminate the technical guidelines	10,500					10,500		10,500			10,500	65
15	Workshop on upscaling strategies (El Salvador)	2,500					2,500				2,500	2,500	14
16	Workshop on upscaling strategies (Jamaica)	2,500					2,500				2,500	2,500	14
17	Workshop on upscaling strategies (Mexico)	2,500					2,500				2,500	2,500	14
18	Hold a workshop to discuss the protocols		9,000				9,000	9,000				9,000	23
19	Training on solid waste management (El Salvador)		15,000				15,000		9,000	6,000		15,000	26
20	2 day Workshop on developing climate-resilient livelihoods		12,000				12,000		12,000			12,000	29
21	Catering for training at schools		35,000				35,000		11,700	11,700	11,6000	35,000	66
22	Workshop on communication strategy (El Salvador)			3,000			3,000			3,000		3,000	36
23	Workshop on communication strategy (Jamaica)			3,000			3,000			3,000		3,000	36
24	Workshop on communication strategy (Mexico)			3,000			3,000			3,000		3,000	36
25	Workshop to present toolkits			5,250			5,250				5,250	5,250	44
26	Regional workshop to share information on SCCF-financed project	-		1,500			1,500				1,500	1,500	46
27	Awareness raising activities El Salvador			41,000			41,000		41,000			41,000	38
28	Awareness raising activities Jamaica			41,000			41,000		41,000			41,000	38
29	Awareness raising activities Mexico			41,000			41,000		41,000			41,000	38
	Sub-total	132,533	160,000	138,750	-	-	431,283	9,000	232,733	110,700	78,850	431,283	
	Meetings/Conferences												
30	Consultations		-	-	-	-	-					-	
31	Presentations research findings			3,000			3,000				3,000	3,000	41

	32	Project Steering Committee Meetings	-	-	-	-	41,000	41,000	12,000	12,000	11,000	6,000	41,000	63
	33	Inception and closure workshop	-	-	-	-	12,000	12,000	6,000			6,000	12,000	64
		Sub-total	-	-	3,000	-	53,000	56,000	18,000	12,000	11,000	15,000	56,000	
		Component total	132,533	160,000	141,750	-	53,000	487,283	27,000	244,733	121,700	93,850	487,283	
		EQUIPMENT AND PREMISES COMPONENT												
	135	Expendable equipment												
	1	Printing of policy briefs, training material and strategies	24,000					24,000		18,000		6,000	24,000	6,913
	2	Designing and printing technical guidelines	3,000					3,000		3,000			3,000	7
	3	Produce digital maps		90,000				90,000	90,000				90,000	19
	4	Printing of assessment reports and protocols		9,000				9,000	9,000				9,000	21,22
	5	Designing and printing of toolkits			18,000			18,000		18,000			18,000	43
		Sub-total	27,000	99,000	18,000	-	-	144,000	99,000	39,000	-	6,000	144,000	
	135	Non-expendable equipment												
	6	Office equipment	-	-	-	4,500	-	4,500	2,500	2,000	-	-	4,500	60
		Sub-total	-	-	-	4,500	-	4,500	2,500	2,000	-	-	4,500	
		COMPONENT TOTAL	27,000	99,000	18,000	4,500	-	148,500	101,500	41,000	-	6,000	148,500	
		MISCELLANEOUS COMPONENT												
	125	Reporting costs												
	1	Reporting			3,500			3,500				3,500	3,500	45
		Sub-total	-	-	3,500	-	-	3,500	-	-	-	3,500	3,500	
	125	Sundry												
	2	Miscellaneous	-	-	-	1,967	-	1,967	500	500	500	467	1,967	62
	3	Telecommunications cost	-	-	-	28,800	-	28,800	8,000	8,000	6,800	6,000	28,800	61
		Sub-total	-	-	-	30,767	-	30,767	8,500	8,500	7,300	6,467	30,767	
	125	Evaluation												
	4	Baseline evaluation including all 3 countries	-	-	-	-	15,000	15,000	15,000	-	-	-	15,000	
	5	Mid-term evaluation including all 3 countries	-	-	-	-	30,000	30,000	-	30,000	-	-	30,000	
	6	Final evaluation including all 3 countries	-	-	-	-	60,000	60,000	-	-	-	60,000	60,000	
	7	Audit	-	-	-	-	20,000	20,000	5,000	5,000	5,000	5,000	20,000	
		Sub-total	-	-	-	-	125,000	125,000	20,000	35,000	5,000	65,000	125,000	
		COMPONENT TOTAL	-	-	3,500	30,767	125,000	159,267	28,500	43,500	12,300	74,967	159,267	

	GRAND TOTAL	520,133	4,417,500	604,100	280,267	178,000	6,000,000	736,850	2,189,583	1,696,950	1,376,617	6,000,000	

Budget Notes

The budget notes with an asterisk (*) are gender-relevant.

1	Consultancy contract for full time Regional Coordinator (48 months @\$12,000/month)	<p>This budget will be used mainly to oversee the deliverables under Component 1 and 3.</p> <p>1.1. Coordinate with the policy experts in each country that policy briefs are developed on the recommended revisions to policies, strategies and plans, including budget allocations to integrate EbA into urban planning and management of natural resources. More specifically, in Activity 1.1.1, 1.1.2 and 1.1.3 collate information in year 1 to identify barriers and opportunities to implement urban EbA, review existing policies and plans related to natural resource management, urban planning and infrastructure development to identify entry points for EbA, recommend revisions to national and local policies and strategies and develop policy briefs based on these recommended revisions.</p> <p>1.2 Lead the development of technical guidelines on planning, implementing the EbA interventions with possible assistance from an adaptation expert.</p> <p>1.3 Provide training on technical guidelines to local government authorities in San Salvador, Kingston and Xalapa in cooperation with an adaptation expert.</p> <p>1.4 Design strategies to upscale EbA across urban and peri-urban areas in El Salvador, Jamaica and Mexico.</p> <p>1.4.2 Hold workshops with national (ES and Jamaica), sub-national (Mexico) and local government authorities from urban planning and NRM departments to present the policy briefs with recommended revisions and upscaling strategies.</p> <p>2.2. Assist with the development of the site-specific protocols for urban EbA implementation – at watershed, urban landscape and household scales. Ensure good cooperation and communication between the stakeholders in each pilot country to create consistency of protocols.</p> <p>3.1. Lead the development of a communication strategy for urban EbA for San Salvador, Kingston and Xalapa</p> <p>3.2. Assist with the development of awareness raising material on urban EbA</p> <p>3.3 Coordinate with national academics on the design and institutionalisation of a long-term research programme. In addition, the RC will assist the M&E expert with the monitoring and evaluation of the project interventions.</p> <p>3.4 Assist the national education expert with the development of educational toolkits on climate change and urban EbA.</p>
---	---	---

		3.5 Collate and disseminate the information generated through the SCCF- project, including the leading of a regional workshop.
2	Consultancy contract for International M&E expert (IME) (4 months @US\$6,000/month)	This budget will be used to contract an expert in Monitoring and Evaluation in an environmental or urban context. This expert will assist the Socio-economic and ecological expert to: 2.1.1. assist 1 month in year 1 with undertaking assessments in San Salvador, Kingston and Xalapa to identify climate vulnerabilities and collect socio-economic data on urban communities. 2.2.2 assist 1 month in year 1 with develop site-specific protocols for urban EbA implementation – at watershed, urban landscape and household scales – based on the worst-case scenario in Output 2.2, the socio-economic assessments and biodiversity undertaken in Output 2.1. and 2.2 respectively. 3.3.3 In total 2 weeks per year over 4 years to assist monitoring the development and implementation of the urban EbA interventions in San Salvador, Kingston and Xalapa in cooperation with the universities.
3	Consultancy contract for National Adaptation Expert (NAE) 17 months @ US\$3,000/month).	This budget will be used to contract a consultancy with expertise in Ecosystem-based Adaptation (EbA) (if available in El Salvador, Jamaica or Mexico) in the urban context. This consultancy will use the funds to develop training plans aimed at improving local and national policy- and decision-makers understanding of EbA. The training plans will be developed using international best practices and lessons learned from adaptation projects in the LAC region. The consultant will then implement the training plans and run training sessions and workshops with local and national policy- and decision-makers. 1.3.2. 4 months per year in year 1 and 2 to assist the Regional Coordinator with providing training on: i) the effects of climate change; ii) planning, implementing and monitoring urban EbA in each pilot city; and iii) the benefits of using EbA to adapt to the effects of climate change in urban areas. 1.3.3-1.3.4. 9 months in year 4 to refine the training material and assist the Regional Coordinator with providing a "training of trainers" programme for sub-national government.
4	National Coordinators (@4,160/month full time)	This budget will be used to hire 3 national coordinators full time to supervise and coordinate the project activities under Outcome 2, particularly Output 2.3 and 2.4.
5*	Workshops to present the recommended revisions to relevant ministries.(including travel, all stationary, lunch and venue hire)	1.1.3 3 workshops in year 1 - one in each country - on EbA for in total 60 national and local policy- and decision-makers. Total costs will be @ US\$1511per workshop, including rent of venue @US\$1,000 and catering for 25 people @US\$500. This workshop will be specific to urban EbA and will use the information collected in activity 1.1.1 and the revisions developed in activity 1.1.2. The workshop will be conducted by the Regional Coordinator. Workshop attendees will include 50% women.
6	Developing and printing policy briefs	1.1.3. This budget will be used for the development and printing of the policy briefs. A total of US\$6,000 to be divided over the three countries.
7	Designing and printing technical guidelines	1.2.1. This budget will be used for the designing and printing of the technical guidelines. \$1,000 for each country.

8	Travel costs to disseminate technical guidelines on urban EbA	This budget of US\$8,700 and US\$11,000 will be used to for travel to hold workshops in each country to present the recommended policy briefs in Activity 1.1.4 and for the dissemination of the technical guidelines developed in Activity 1.2.2. for national and local government. For Activity 1.1.4, travel reimbursement 25 X @US\$50 for 3 countries =US\$3,750 and travel RC to 2 countries @US\$3,000; and DSA RC for 3 countries @300/day for 2 days totalling US\$1,800. For Activity 1.2.2, total budget for travelling is: @ US\$11,000 including travel for RC to 1 country ~US\$1,500; DSA @300/day for 2 days for 3 countries =US\$1,800; travel compensation in total 150 participants (50 per country including community and government representatives)@US\$50=US\$7,500
9	Printing of training material	This budget is used for printing training material under Activity 1.3.1. US\$4,000 for each country.
10	Training on urban EbA	1.3.2. 3 days training on urban EbA in year 2 with a follow up training in year 3 and 4 using the technical guidelines developed in activity 1.2.1. A total of 4 days of training (3 days in year 2 and 3 days in year 3 and 1 day in year 4 for national government in El Salvador and Jamaica and 3 days training in year 2, 3 days in year 3 and 1 day in year 4 of local government in Mexico. 25 people per country with in total 75 representatives of government. Cost of venue and catering are ~US\$1,500 per day, totalling US\$4,500 per country for year 2 and 3 and US\$1,500 for year 4. Remaining budget is for training material that can include excursions with transport to a site to apply lessons learned from workshop.
11*	Training of trainers workshop on urban EbA	1.3.4. 2 day Training of Trainers workshop for representatives of the national and sub-national government of all three countries on urban EbA in year 4 based on the refined training material developed in activity 1.3.3. The allocated budget includes all training material @US\$50 per participant for a maximum of 40 per country (50% women), totalling US\$6,000. Cost of venue and catering are US\$1,500 per day per country, with a total of US\$3,000 per country.
12	Regional Expert in Environmental Economics/Financing expert (5 months @ US\$6,000/month for each of year 3 and year 4)	This budget will be used to contract a Regional Expert in Environmental Economics/Financing. This expert will identify and detail financing mechanisms for inclusion in the technical guidelines developed by the RC and adaptation expert. This expert will identify barriers to national dialogue on adaptation and mobilisation of funds for EbA implementation, and develop a strategy to overcome these barriers. 1.4.1 and 1.4.2. Develop the different strategies for upscaling urban EbA in close collaboration with the Regional Coordinator.
13	Printing the strategies	This budget is used for printing the strategies under Activity 1.4.1. US\$2,000 for each country.
14*	Hold a workshop with national (ES and Jamaica), sub-national (Mexico) and local government authorities to present the upscaling strategies.	This budget (including venue hire and catering) will be used to hold a 1 day workshop in each country to present the upscaling strategies developed under Activity 1.4.1. Total costs will be @ US\$2,500 per workshop, including rent of venue @US\$1,000 and catering for 25 people @US\$20 = US\$500. There is an extra US\$1,000 budget available for an extra 1/2 day venue hire if necessary. Participants will have 50-50 gender

		representation.
15	Develop a Watershed management plan (@\$48,500)	This budget under 1.4.3 will be used to develop a watershed management plan for the Arenal-Monserrat area in San Salvador. The development includes water sampling and mapping @US\$15,000; training workshops @US\$23,500 and printing of the plan @US\$10,000.
16	Consultancy contract for Regional Socio-economic Expert (13 months@ US\$5,000/month)	This budget will be used to contract a Regional Expert in Socio-economics. This expert will undertake assessments to identify the risks and adaptation needs of urban communities to the effects of climate change. 2.1.1. 4 months in year 1 to undertake assessment in San Salvador, Kingston or Xalapa to identify climate vulnerabilities and collect socio-economic data on urban communities. 2.1.2. 4 months in year 1 to collate data on population growth, planned economic activities, development plans, disaster risk, and land-use change – that will most likely affect well-being of local communities. The finding will be presented in a report. 2.4.1 This budget will be used to hire a National Socio-economic expert to develop a community strategy and assist developing and implementing the additional climate-resilient livelihoods under Activity 2.4.1 in a participatory way that meets the needs of the targeted local communities. @5 months of which 1 month in year 1 and 4 months in year 2.
17	Consultancy contract for Regional GIS expert (8 months@ US\$3,000/month)	This budget will be used to contract a Regional GIS expert. 2.1.3. 4 months to collate spatial data on climate trajectories at the city level for San Salvador, Kingston and Xalapa. 2.1.4. 4 months to produce maps to show the worst-case scenarios related to urban development, climate-related risks and resource availability under conditions of climate change.
18	Consultancy contract for National GIS expert (8 months@ US\$2,500/month)	This budget will be used to contract a National GIS expert. 2.1.3. 4 months to collate spatial data on climate trajectories at the city level for San Salvador, Kingston and Xalapa. 2.1.4. 4 months to produce maps to show the worst-case scenarios related to urban development, climate-related risks and resource availability under conditions of climate change.
19	Produce maps based on the information in GIS	This budget will be used to produce maps based on the information collected under Activity 2.1.1, 2.1.2 and 2.1.3. US\$30,000 for each country.
20	Regional Ecology Expert (5 months @ US\$5,000/month)	This budget will be used to contract a Regional expert in biodiversity and ecology who will collect and update data and information on biodiversity and ecology for the urban EbA intervention areas in San Salvador, Kingston and Xalapa. 2.2.1. 3 months to undertake biodiversity and ecosystem assessments in each of the project intervention sites and write a report with recommendations for each intervention site. 2.2.2 2 months to assist the national coordinators and regional coordinator with the development of site-

		specific protocols.
21	Print the assessment reports	This budget will be used to print the reports of the biodiversity assessments done on each intervention site. A total of US\$3,000 to be divided over the three countries.
22	Print the site-specific protocols	This budget will be used to print the site specific protocols developed under Activity 2.2.2. A total of US\$6,000 to be divided over the three countries.
23*	Hold a workshop to discuss and validate the protocols with identified stakeholders for each city.	This budget will be used to hold a workshop to discuss and validate the specific protocols developed under Activity 2.2.2. The workshop will be conducted by the Regional coordinator in collaboration with the national coordinators. Costs for the workshop are US\$3,000 per country and include venue hire and catering. Participants will include 50-50 gender representation.
24	Consultancy contract for National Urban Planning Expert (NUPE) (@\$5,000/month)	This budget will be used to contract an urban planning expert to assist the other technical consultants in the implementation of the EbA interventions at urban landscape scale. 2.3.1 30 days in year 2 to provide guidance to the hydrologist and ecologist on the location of the interventions in San Salvador and ensure the interventions fit into existing local plans. 2.3.2 30 days in year 2 to provide guidance to the hydrologist and ecologist on the location of the interventions in Kingston and ensure the interventions fit into existing local plans. 2.3.2 30 days in year 2 to provide guidance to the hydrologist and ecologist on the location of the interventions in Xalapa and ensure the interventions fit into existing local plans.
25*	Implement appropriate EbA interventions at watershed, urban landscape (city) and household scales in San Salvador based on the protocols developed under Output 2.2.	This budget @US\$966,000 will be used to implement urban and peri-urban EbA interventions at watershed, urban landscape and household scale. Beneficiaries will include 50% women. 2.3.1. Promoting sustainable agriculture: <ul style="list-style-type: none"> • developing 1,000 hectares of sustainable agriculture in the Arenal-Monserrat watershed, including the construction of vegetated infiltration ditches on the slope of the San Salvador volcano; • restoring 16 km of riparian vegetation in 4 ravines (4 km per ravine) using native fruit trees in the area; • constructing 30 infiltration wells (of 1 metre height) to improve water infiltration and increasing storage of storm water runoff; • constructing rainwater harvesting systems in the community of El Trebol; • constructing rainwater harvesting systems for ten schools; and • establishing ecological sanitation (management of grey water and sewage) at two schools to close the water cycle.
26*	Training on solid waste management (El Salvador)	This budget @US\$16,800 will be used to provide training to the target community and the schools in the Arenal-Monserrat area on the management of solid waste. Participants will include 50-50 gender representation. 2.3.1 2 x 2 days of training in year 2 and 1 x 2 days follow up training in year 3. Venue hire @US\$2,000 per 2

		day training, totalling US\$4,000 in year 2 and US\$2,000 in year 3. Catering @US\$10 per person per day for 60 people per school = \$10 x 60 x 2 days = US\$1,200 per 2 days. There will be 3 schools at each training @ US\$1,200 x 3 = US\$3,600 per training session. 2 training sessions in year 2 @ US\$2,000 + US\$3,600 each = US\$11,200. 1 training session in year 3 @ US\$2,000 + US\$3,600 each = US\$5,600.
27*	Implement appropriate EbA interventions at watershed, urban landscape (city) and household scales in Kingston based on the protocols developed under Output 2.2.	<p>This budget @US\$881,500 will be used to implement urban and peri-urban EbA interventions at watershed, urban landscape and household scale. The costs of construction include the sub-contracts for the service providers. Beneficiaries will include 50% women.</p> <p>2.3.2.</p> <ul style="list-style-type: none"> • planting 4,200 trees in the Hope watershed using drought-resilient tree species; • rehabilitate 2 hectares of the wetlands in Greenwich Town to increase water storage; • constructing 3 detention basins made from natural material to improve water infiltration and increase storage of storm water runoff; • constructing 500 metres of dykes; • constructing 2,500 metres of permeable pavements and walkways using grass and other appropriate plant species; • constructing one rainwater harvesting system each at Camperdown High School, St Andrews Technical School, Kingston Technical College and Tivoli Gardens School; and • constructing a rainwater harvesting system at two community buildings.
28*	Implement appropriate EbA interventions at watershed, urban landscape (city) and household scales in Xalapa based on the protocols developed under Output 2.2.	<p>This budget @US\$893,000 will be used to implement urban and peri-urban EbA interventions at watershed, urban landscape and household scale. The costs of construction include the sub-contracts for service providers. Beneficiaries will include 50% women.</p> <p>2.3.3.</p> <ul style="list-style-type: none"> • restoring the area of the El Palenquillo stream by: i) planting 3,640 trees (1,820 on each side of the river, 2 metres apart); and ii) constructing infiltration ditches (0.6 metres deep, 0.5 metres wide, covered with 2 centimetres of gravel); • restoring the Cerro del Estropajo hill by: i) planting 20,000 trees using montane forest species; and ii) constructing 2,803 metres of infiltration ditches; and iii) constructing 1,667 metres retention berms to retain soil and increase the infiltration; • constructing two permeable, concentric sports circuits – each 1,000 metres long – to promote rainwater infiltration (one constructed with permeable concrete, the other with gravel); • constructing an artificial wetland in the green area of the Telesecundaria school Rafael Hernández Ochoa, which will also be used to cultivate ornamental plants; and • installing 10 rainwater-harvesting systems (at 8 schools and 2 public buildings).

29	Workshops (@\$4,000)*	This budget will be used to hold workshops to present the strategies developed under Activity 2.4.1 for managing the urban EbA interventions. Cost of venue and catering are ~US\$2,000 per day per country, with a total of US\$4,000 per country. Participants will include 50-50 gender representation.
30	Equipment for additional livelihood activities San Salvador	This budget of US\$60,000 will be used to provide i) agricultural start up kits at 10 schools @\$2,000 in year 2, totalling US\$20,000. The start-up kit will include seeds and fertilizer, tools @US\$1000 per school, totalling US\$20,000; and transport and food for work @US\$1,000 per school, totalling US\$10,000. In addition fruit trees will be provided to be planted @US\$12,000 and training material for waste management @US\$8,000.
31	Equipment for additional livelihood activities Kingston	This budget @US\$180,200 will be used to provide equipment for urban gardens, fruit trees and beehives at the 4 selected schools. <ul style="list-style-type: none"> • planting 400 fruit trees and 1,000 forest trees in 2.3 hectares in May Pen Park, in Kingston; • providing 250 hives and equipment to promote bee-keeping at the community space in May Pen Park in Kingston; • planting 400 fruit trees along the perimeter of the football field at Tivoli High School; • planting 400 fruit trees along the perimeter of Camperdown High School; • providing equipment for container gardening at Kingston Technical School; and • providing equipment for the greenhouse and nursery as part of the agricultural improvement programme at St Andrews Technical College.
32	Equipment for additional livelihood activities Xalapa	This budget @US\$155,000 will be used to provide agricultural start up kits at @US\$2,000 x 8 schools and 2 public spaces, totalling \$20,000 in year 2.
33	National Agricultural Expert (22 months @ US\$3,000/month)	This budget will be used to contract a national expert in agriculture to implement peri-urban EbA interventions related to sustainable agriculture in San Salvador, Kingston and Xalapa. In year 2, the expert will spend 4 months in each country to assist with the development of urban agriculture. In addition, the agricultural expert will spend a total of 13 months in the field as follows: in year 3, there will be 3 months assistance in El Salvador, 2 months in Jamaica and Mexico; in year 4, the assistance by the agricultural expert will be 1 month in each country. This includes: <p>2.4.3 2x5 days to provide on-the-job training to the local urban communities in San Salvador, Kingston and Xalapa on establishing and maintaining urban food gardens.</p>
34	Training on using equipment	This training, including material, will be provided by the national agricultural expert and will focus on: i) establishing and maintaining the urban food gardens; and ii) potential livelihoods from these gardens. One training session in year 2 with follow up training in year 3 and 4 and using the equipment for local communities (@ US\$ 2,000 per school, totalling US\$40,000 for El Salvador; 4 schools x US\$2,000=US\$8,000 for Jamaica and 10schools x US\$2,500 =US\$25,000 for Mexico). Beekeeping training material is estimated @US\$3,000.

35	Regional Communication expert (16 months @\$4,625 per month)	<p>3.1.1 The communication expert will draft a communication strategy and action plan and conduct a local and school specific awareness raising activities according to the strategy and workplan. The campaign will include, the production of promotion materials: leaflets, brochures, freecards, educational packages and their distribution at different events such as the DMRD week, climate change action day. The communication expert will also meet with NGOs, journalists to gain further information and will use Social media, TV and Radio spots, posters and other means of raising awareness. This will be 3 months in year 3 and 2 months in year 4.</p> <p>3.2.1 Developing communication material 3 months in year 1 and 3 months in year 3</p> <p>3.2.2 Implementing national, local and school specific awareness raising campaigns. The school specific awareness raising campaign will include budget that will be used for travel to and organisation of site visits where EbA is being implemented for local schools. This includes participation of local schools in tree planting and urban gardening. This will be 3 months in year 2 and 2 months in year 4.</p>
36*	Workshop to present communication strategy	This budget will be used to hold a 2-day workshop @\$3,000 in each country totalling @\$9,000 in year 3 to present and discuss the proposed communication strategies developed under Activity 3.1.1. The workshop costs include venue hire @US\$1,000 and catering for 40 people per country @US\$15 per day US\$600 for 2 days in year 3. Participants will include 50-50 gender representation.
37	Consultant contract for a Web-designer (US\$12,000 to design website in year 4)	This budget will be used to hire a web-designer to develop an online portal to share information on urban EbA. 3.1.2 3 months @3,000/month and maintenance and updating in year 4
38*	Implementing costs	This budget will be used to Implement the communication and awareness raising strategy using the material developed in Activity 3.2.1. The budget is US\$41,000 in total per country. The communication and awareness strategy will take into account the different ways men and women prefer to receive information. The activity will include <i>inter alia</i> developing brochures and holding campaigns.
39	National Academics (@ US2,000/month)	<p>3.3.1. 1 month @ \$2,000 for 3 countries = \$6,000 to design a long term research programme to assess the performance of EbA interventions by monitoring the bio-physical and socio-economic benefits of the implemented interventions.</p> <p>3.3.2. 1 month @ \$2,000 for 3 countries = \$6,000 to facilitate and arrange an MoU between the University and the financial executive of the SCCF-financed project.</p> <p>3.3.3. 2 months per year @ \$2,000 per month for years 2-4 for 3 countries = \$36,000 to oversee the implementation of the long-term monitoring programme developed in Activity 3.3.1 .</p>
40*	Research stipend for MScs (@ US\$ 10,000).	3.3.3. Stipend for academic supervision of PhD and MSc candidates (50% women). US\$5,000 for year 1 and US\$2,500 for year 3 and US\$2,500 for year 4 per country for 3 countries = \$30,000.
41	Presentations (@US\$1,000)	3.3.4 This budget of US\$1,000 per country will be used for catering and if needed a small fee for venue hire to present the preliminary research findings on the EbA interventions. Costs are estimated at rent of room at

		university @US\$500 and catering for 50 people @US\$10 =US\$500.
42	Regional Education Expert (9 months@US\$5,000/month)	This budget will be used to hire a regional education expert to develop and pilot the educational toolkits in Activity 3.4.1 and 3.4.2 for primary and secondary schools in San Salvador, Kingston and Xalapa. 4 months in year 1 (US\$20,000), 3 months in year 3(US15,000) and 2 months in year 4(US\$10,000).
43	Designing and printing (@18,000)	This budget will be used to design and print the educational toolkits developed under Activity 3.4.1. The amount is to be divided over the three countries.
44*	Workshop to present toolkits	This budget @US\$1,750 per country will be used for the educational expert to hold a workshop to present the educational toolkits. Participants will include 50-50 gender representation. 3.4.3 1 day workshop in each country to present the educational toolkits. Venue hire @US\$1,000; catering 50 (including school representatives) x US\$15 =US\$750.
45	Reporting	This budget @US\$3,500 will be used under Activity 3.5.1 for the regional coordinator for costs to report to the PRC and other regional networks on the results of the EbA interventions of the SCCF-financed project.
46	Workshop costs to disseminate information on SCCF-financed project	This budget @1,500 will be used to hold a regional workshop to disseminate the collected information during the SCCF-financed project. Venue hire @US\$1,000; catering: 25 x US\$15 = US\$375.
47	Administration and Finance Officer	This budget will be used to hire a part-time Regional Administration and Finance Officer (AFO). the AFO will take responsibility to handle the procurement and all admin under Component and 3. In particular, the AFO will also be involved with all admin regarding the release of funding for Component 2.
48	Travel to provide training on urban EbA	This budget totalling US\$ 36,000 will be used for the adaptation expert to provide training on urban EBA to each of the countries under Activity 1.3.2. <u>Specific costs include:</u> US\$2,050 travel for adaptation expert per country per year to three countries for years 2, 3 and 4 = \$18,450; US\$50 reimbursements to 25 participants, for travel and terminal expenses in each of the 3 countries for three years = US\$11,250. DSA for Adaptation expert @300/day x 3 days for 3 countries per year for years 2 and 3 = US\$5,400. For year 4 the follow-up workshop is 1 day in each country so DSA @300/day x3 = @ US\$900.
49	Travel for Training of trainers	This budget @US\$10,950 will be used for the adaptation expert to provide training to local and national authorities in each of the countries on urban EBA under Activity 1.3.4. Specific costs include: US\$1,500 travel for adaptation expert to 3 countries totalling US\$4,500, US\$50 reimbursements to 25 participants, for travel and terminal expenses in each of the 3 countries=US\$3,750 and DSA for Adaptation expert @US\$300/day x 3 days for 3 countries =US\$2,700.
50	Travel for workshop on upscaling strategies	This budget @US10,950 will be used for the Regional Coordinator to hold a workshop for urban planning, NRM departments and relevant private sector representatives in each of the countries under Activity 1.4.2. Travel to each country @US1,500 per country totalling US\$4,500, DSA@300/day for 3 days per country totalling US\$2,700 and US\$50 reimbursements to 25 participants, for travel and terminal expenses in each of

		the 3 countries=USD\$3,750.
51	Travel to three countries for socio-economic assessments	This budget for a total of US\$20,100 will be used for the Regional socio-economic expert and International M&E expert to travel to and within each of the three countries. Tickets for 1 visit per person @US\$1,500 per country, totalling 3xUS\$1,500 = US\$4,500. For 2 people: 2xUS\$4,500= @US\$9,000; DSA for regional socio-economic expert @US\$300/day for 9 days per country in year 1 totalling US\$8,100. DSA for International M&E expert @US\$300/day for 10 days for all three countries totalling US\$3,000.
52	Travel to three countries for ecological assessments	This budget for a total of US\$11,700 will be used for the Regional Ecological expert to travel to and within each of the three countries. Tickets @US\$1,500 per country totalling @US\$4,500; and DSA @300/day for 8 days per country in year 1 totalling US\$6,300.
53	Travel to three countries for workshop on protocols	This budget of US\$10,050 will be used for the Regional Coordinator to hold a workshop for local and national stakeholders, including private sector and communities, in each of the countries under Activity 2.2.2. Tickets @US\$1,500 per country totalling @US\$4,500; DSA @300/day for 2 days per country totalling US\$1,800; US\$50 reimbursements to 25 participants, for travel and terminal expenses in each of the 3 countries=USD\$3,750.
54	Travel for traditional livelihood workshop	This budget @US\$10,950 will be used for the Regional socio-economic expert to travel to each of the three countries in year 2 to hold the workshop @US\$4,500. DSA @300/day for 3 days per country = US\$2,700. US\$50 reimbursements to 25 participants, for travel and terminal expenses in each of the 3 countries=USD\$3,750.
55	Travel for training on urban agriculture	This budget @US\$11,700 will be used for the National Agricultural expert to travel to each of the three countries to provide on-site training. Travel costs El Salvador and Jamaica total @US\$200 each; Mexico (from Capital) @US\$500; DSA @US\$300/day for 3 days for 3 countries=US\$2,700 per year. Total per year US\$3,600 for three years = US\$10,800. An additional US\$1,500 is for a ticket for the International M&E expert in year 2.
56	Travel for workshop communication strategy	This budget totalling US\$ 12,000 will be used for the Regional Communication expert to hold a workshop in each country in year 3. In year 3: travel to each of the three countries to hold the workshop @US\$4,500; DSA @US\$300/day for 3 days for 3 countries=US\$2,700. Transport compensation @US\$40 for 40 participants per country (including local and national representatives), totalling US\$4,800.
57	Travel for presenting toolkits and workshop	This budget @US\$11,450 will be used for the Regional Educational expert to hold a workshop in each country in year 3 to present and discuss the educational toolkits. Travel to each of the three countries to hold the workshop @US\$4,500; DSA @US\$300/day for 3 days for 3 countries=US\$2,700. US\$50 reimbursements to 25 participants, for travel and terminal expenses in each of the 3 countries=USD\$3,750. National representatives (Mexico) 5 x US\$100 = US\$500
58	Travel for regional workshop	This budget @US\$16,400 will be used for the Regional Coordinator and other stakeholders from the three

		countries to attend the regional workshop. It is advised to hold the workshop in one of the three countries to minimise travel costs. In addition, it is advised to combine this meeting back to back with a PSC meeting to further minimise travel costs. Travel costs for 1 GEF representative and 1 UNEP representative will be covered under PSC meeting as per budget line 64. For regional workshop: 1 RC, 2 NCs, 2 academia, 2 representatives of executing agencies, 2 baseline project representatives = 9 participants. Travel costs 9 x @US\$1,500 totalling US\$13,500. DSA: 9 x US\$300 = US\$2,700. US\$50 reimbursements to 1 NC and 3 local representatives, for travel and terminal expenses: 4 x US\$50 = \$200.
59*	Training in levee, drain and pond maintenance	This training will prepare both technical government staff and local communities on how to manage solid waste in San Salvador (@US\$8,000) and Kingston and how to maintain the constructed interventions such as the dyke, drains and the detention pond in Kingston (@US\$15,000). Beneficiaries will include 50% women.
60	Office equipment	Office equipment. Including, computers and office supplies. US\$4500 over the duration of the project
61	Telecommunications cost	Telecommunications cost including telephone and internet. US\$28,800 for the three countries for 4 years.
62	Miscellaneous	Miscellaneous costs. US\$1,967 for 4 years.
63	Project Steering Committee Meetings	This budget of US\$41,000 is reserved for annual meetings for the PSC @US\$12,000 per year for year 1 and 2, US\$11,000 for year 3 and US\$6,000 for year 4 including travel and DSA. It is advised to each year have the meeting in one of the three countries to minimise travel costs and at a time that the RC will be in one of the countries as well, which means only 9-3 is 6 people travel. Travel costs year 1-3: 6x US\$1,500 = US\$9,000. For year 4: Travel costs for 1 GEF representative and 1 UNEP representative @US\$1,500 = US\$3,000. DSA@300/day x 9 people = US\$2,700 per year for 4 years.
64	Inception and closure workshop	This budget is for a regional inception and closure workshop for the project representatives.
65*	Workshop to present and disseminate the technical guidelines	This budget of US\$3,500 per country (totalling US\$10,500) will be used to rent venue @US\$1,000/day for 2 days x 3 workshops = US\$6,000; lunch for 50 people @ US\$15 for 2 days x 3 workshops = US\$4,500. Participants will include 50-50 gender representation.
66	Catering for providing the training on urban gardens at the schools, 1 day at each school.	2.4.3 Training will be provided every year to a new class. Catering: US\$9.5 x 50 learners x 10 schools = US\$4,750 per year for El Salvador for 3 years; US\$9.5 x 50 learners x 10 schools = US\$4,750 per year for Mexico for 3 years; US\$9.5 x 50 learners x 4 schools = US\$1,900 per year for Jamaica for 3 years + US\$9.5 x 10 specialists x 4 schools for maintenance and bee-keeping = US\$1,140 for 3 years. Totalling US\$35,000.
67	Travel for International M&E expert	This budget will be used for travel of the international M&E expert in year 2, 3 and 4 to the 3 countries. For years 2, 3 and 4: 2x US\$1,500 per year for travel to Jamaica and Mexico totalling US\$9,000; For years 2, 3 and 4: 1x US\$1,000 for travel from Mexico to El Salvador, totalling US\$3,000.

Appendix 5: Co-Financing Budget

RECONCILIATION BETWEEN GEF ACTIVITY BASED BUDGET AND UNEP BUDGET LINE (GEF FUNDS ONLY US\$)							
Project title:		Building the resilience of urban communities in the LAC region through ecosystem based adaptation (EbA)					
Project number:							
Project executing partner:		UNEP-ROLAC, MARN, MWLECC and SEMARNAT					
Project implementation period:							
From:	2016	GEF	IDB (El Salvador)	JSIF (Jamaica)	CONAGUA (Mexico)	UNEP-ROLAC	
To:	2020						
UNEP Budget Line		Cash	Grant	Grant	Grant	In-kind + Grant	Total
	PERSONNEL COMPONENT						
	1100	Project personnel					
	1101	National Coordinator (El Salvador)	200 000				200 000
	1102	National Coordinator (Jamaica)	200 000				200 000
	1103	National Coordinator (Mexico)	200 000				200 000
	1104	Regional coordinator (48 months @\$12,500/month)	576 000				576 000
	1199	Sub-total	1 176 000				1 176 000
	1200	Consultants	-				-
	1201	International M&E expert	24 000				24 000
	1202	Adaptation expert	51 000				51 000

	1203	Regional Environmental Economics and Finance expert	60 000					60 000
	1204	Regional Socio-economic expert	65 000					65 000
	1205	Regional GIS expert	24 000					24 000
	1206	GIS expert (El Salvador)	20 000					20 000
	1207	GIS expert (Jamaica)	20 000					20 000
	1208	GIS expert (Mexico)	20 000					20 000
	1209	Regional Ecological expert	25 000					25 000
	1210	National Agricultural expert (El Salvador)	24 000					24 000
	1211	National Agricultural expert (Jamaica)	21 000					21 000
	1212	National Agricultural expert (Mexico)	21 000					21 000
	1213	National Urban Planning expert (El Salvador)	5 000					5 000
	1214	National Urban Planning expert (Jamaica)	5 000					5 000
	1215	National Urban Planning expert (Mexico)	5 000					5 000
	1216	Regional Communication expert	75 000					75 000
	1217	Regional Education expert	45 000					45 000
			-					-

	1299	Sub-total	510 000					510 000
	1300	Administrative Support	-					-
		Administration and Finance Officer (50%)	100 000					100 000
		Senior management						
	1399	Sub-total	-					-
	1600	Travel on official business	193 250					193,250
	1601		-					-
	1602	NC and RC travel						-
	1699	Sub-total	193 250					193 250
	Component total		1 979 250					1 979 250
			-					-
	SUB-CONTRACT COMPONENT		-					-
	2100	Sub-contracts (MOUs/LOAs for cooperating agencies)	-					-
	2101	With Universities	-					-
	2199	Sub-total	-					-
	2200	Sub-contracts (MOUs/LOAs for supporting	-					-

		organizations)						
	2201	National academics	48 000					48 000
	2299	Sub-total	48 000					48 000
	2300	Sub-contracts (for commercial purposes)	-					-
	2301	National Website designer/consultant	12 000					12 000
	2302	MSc candidates	30 000					30 000
	2399	Sub-total	42 000					42 000
	Component total		90 000					90 000
			-					-
	TRAINING COMPONENT		-					-
	3200	Group training	-					-
	3201	Training on urban EbA (El Salvador)	16 000	200 000			50 000	266 000
	3202	Training on urban EbA (Jamaica)	16 000		250 000		50 000	316 000
	3203	Training on urban EbA (Mexico)	18 000				50 000	68 000
	3204	Training of Trainers workshop	12 000					12 000
	3205	Strengthening drainage master plan El Salvador	48 000	900 000			25 000	973 500
	3206	Training on solid waste		200 000				

		management	8 000					208 000
	3207	Training for school garden committee and environmental guards (El Salvador)	30 000					30 000
	3208	Training for urban gardens (Jamaica)	11 000					12 000
	3209	Training in levee, drain and pond maintenance	15 000					15 000
	3210	Training local community and schools (Mexico)	25 000					25 500
	3211	Workshop costs to present recommended revisions (El Salvador)	1 511				25 000	26 511
	3212	Workshop costs to present recommended revisions (Jamaica)	1 511				25 000	26 511
	3213	Workshop costs to present recommended revisions (Mexico)	1 511				25 000	26 511
	3214	Workshop on upscaling strategies (El Salvador)	2 500	196 000			25 000	223 500
	3215	Workshop on upscaling strategies (Jamaica)	2 500					2 500
	3216	Workshop on upscaling strategies (Mexico)	2 500					2 500
	3217	Workshop to discuss the protocols	9 000					9 000
	3218	Workshop on developing climate-resilient livelihoods	12 000					12 000
	3219	Workshop on communication strategy	3 000				25 000	28 000

		(El Salvador)					
	3220	Workshop on communication strategy (Jamaica)	3 000			25 000	28 000
	3221	Workshop on communication strategy (Mexico)	3 000			25 000	28 000
	3222	Workshop to present toolkits	5 250				7 000
	3223	Regional workshop to share information on SCCF-financed project	1 500			50 000	51 500
	3299	Sub-total	247 783				310 033
	3300	Meetings/Conferences	-				-
	3301	Consultations	-				-
	3302	Presentations research findings	3 000				3 000
	3303	Project Steering Committee Meetings	41 000				41 000
	3304	Inception and closure workshop	12 000				12 000
	3399	Sub-total	56 000				56 000
	Component total		112 000				366 033
			-				-
	EQUIPMENT AND						

	PREMISES COMPONENT		-					-
	4100	Expendable equipment	-					-
	4101	Printing of policy briefs, training material and strategies	24 000		250 000			274 000
	4102	Designing and printing technical guidelines	3 000					3 000
	4103	Produce GIS maps	90 000					90 000
	4104	Printing of assessment reports and protocols	9 000					9 000
	4105	Designing and printing of educational toolkits	18 000		250 000			271 000
	4106	Reporting	3 500					
	4106	Office equipment	4 500				20 000	24 500
	4107	Telecommunications cost	28 800				60 000	88 800
	4108	Miscellaneous	1 967					1 967
	4199	Sub-total	144 000					182 267
	4200	Non-expendable equipment	-					-
	4201	El Salvador-Equipment and EbA interventions	966 000	18 800 000				19 766 000
	4202	Jamaica-Equipment and EbA interventions	881 500		2 500 000			3 381 500
	4203	Mexico-Equipment and EbA interventions	893 000			2 000 000		2 893 000

	4204	El Salvador-Additional livelihoods	60 000	1 690 000				1 755 000
	4205	Jamaica-additional livelihoods	180 200		500 000			680 000
	4206	Mexico-additional livelihoods	155 000			1 120 000		1 275 000
	4207	Awareness raising activities El Salvador	41 000					41 000
	4208	Awareness raising activities Jamaica	41 000		250 000			291 000
	4209	Awareness raising activities Mexico	41 000					41 000
			-					-
	4299	Sub-total	3 263 500					3 263 500
	Component total		3 445 767					3 445 767
			-					-
	MISCELLANEOUS COMPONENT		-					-
	5200	Reporting costs	-					-
	5299	Sub-total	-					-
	5300	Sundry	-					-
	5499	Sub-total	-					-
	5500	Evaluation	-					-

	5501	Baseline evaluation including all 3 countries	15 000					35 000
	5502	Mid-term evaluation including all 3 countries	30 000					35 000
	5503	Final evaluation including all 3 countries	60 000					35 000
	5504	Audit	20 000					20 000
	5599	Sub-total	125 000					128 500
	Component total		125 000					128 500
			-					-
	GRAND TOTAL		6 000 000	21 986 000	4 000 000	3 120 000	628 000	35 734 000

Appendix 6: Results Framework

Outcomes/ Outputs	Indicators	Baseline	End-of-project targets	Means of Verification
Project objective: To reduce the vulnerability of communities living in three medium-sized Latin American and Caribbean cities to the effects of climate change through the integration of Ecosystem-based Adaptation (EbA) into urban planning in the medium- to long-term.	1. Total number of direct beneficiaries from the project (and % of which are women).	Zero	<p>At least 194,090 people benefitting from the project (of which at least 50% are women).</p> <p><u>El Salvador:</u> 115,500 people in the Arenal-Monserrat watershed, of which ~53% are women.</p> <p><u>Jamaica:</u> 8,000 residents (2,500 households, of which ~60% are headed by women) in Greenwich Town. 6,000 students at 4 schools, of which ~55% women. 28,000 people in Petersfield district, of which ~60% women.</p> <p><u>Mexico:</u> 36,590 people in the Carneros watershed, of which ~53% women.</p>	Household surveys. Attendance registers from training sessions and training reports.
Outcome 1: Technical capacity of government stakeholders from urban development and natural resource management ministries to integrate EbA into planning, policies and regulations strengthened.	1. Number of relevant government staff within each targeted national and local institution with improved technical capacity to identify, prioritise, plan and implement urban EbA (disaggregated by gender).	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	<p>By project end-point, at least 190 relevant government staff (of which at least 50% are women) within targeted institutions have increased technical capacity to identify, prioritise, plan and implement urban EbA.</p> <p><u>El Salvador:</u> At least 40 people are trained, of which ~40% are women.</p> <p><u>Jamaica</u> At least 100 people are trained, of</p>	Attendance registers from training sessions and training reports. A capacity scoring methodology as suggested by the GEF AMAT will be adopted. The scoring is based on five criteria expressed as questions (these criteria will be further validated at inception phase): 1. Are the relevant government staff able to understand and interpret climate information to support them in identifying climate change risks 2. Do the relevant government staff have

			<p>which ~50% are women.</p> <p><u>Mexico:</u> At least 50 people are trained, of which ~50% are women.</p>	<p>the ability to identify locations vulnerable to the predicted effects of climate change in the city?</p> <p>2. Are the relevant government staff able to identify, prioritise and plan appropriate urban EbA interventions as well as specify budget allocations and targets for these interventions?</p> <p>4. Are the relevant government staff able to plan and coordinate with other stakeholders on urban EbA interventions across climate-sensitive sectors?</p> <p>5. Are the institutions able to monitor and evaluate the socio-economic and environmental benefits associated with the implementation of urban EbA interventions?</p> <p>Each question is answered with an assessment and score for the extent to which the associated criterion has been met: not at all (= 0), partially (= 1) or to a large extent/ completely (= 2). An overall score is calculated, with a maximum score of 10 given five criteria.</p> <p>Government staff that have their score increased by at least 3 points will be considered to have increased technical capacity to identify, plan, implement and evaluate urban EbA. Baseline values to be verified prior to participation in training activities.</p>
	<p>2. Number of technical guidelines developed on urban EbA.</p>	<p><u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero</p>	<p>At least three sets technical guidelines developed for each city to plan, implement and monitor urban EbA (nine in total).</p>	<p>Technical guidelines.</p>

	3. Number of policy briefs developed with relevant government stakeholders outlining recommendations for revisions to policies/strategies/plans to integrate EbA (AMAT indicator 12).	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	At least one set of policy briefs, developed with relevant government stakeholders, produced for each country to guide revision of national and city policies, strategies and plans (three in total).	Policy briefs, policy/strategy documents.
	4. Number of draft upscaling strategies developed for urban EbA.	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	One urban EbA upscaling strategy developed in each country (three in total).	EbA upscaling strategy document.
Outcome 2: Demonstration of EbA in San Salvador, Kingston and Xalapa to increase the capacity of urban and peri-urban communities to adapt to the effects of climate change.	1. Number of hectares and kilometres restored by the project using EbA interventions.	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	<u>El Salvador:</u> 1,000 hectares of sustainable agriculture in the Arenal-Monserrat watershed, which includes the vegetated infiltration ditches on the slope of the San Salvador volcano. 16 kilometres of riparian forest restored along 4 ravines (4 kilometres each). 150 hectares of critical ecosystems restored. <u>Jamaica:</u> 4,200 trees planted across 44,000 ha to contribute to restoration in the Hope watershed. 500 metres of dykes. 2 hectares of the wetland in Greenwich town rehabilitated. 2,500 metres of permeable pavements and walkways. 2.3 hectares in May Pen Park, in Kingston, including 400 fruit trees and 1,000 forest trees planted.	Field visits to verify the extent of restored areas. GPS waypoints and GIS mapping of interventions. Repeat photography of the selected intervention sites in the three cities. Interviews with local community members.

			<p><u>Mexico:</u> 3,600 metres of riparian corridor restored. 2,800 metres infiltration ditches and 1,670 metres of berms. 200 m connectivity corridor between EbA action gardens. 2,000 metres of linear park. 2,000 m of concentric circuits, one for cycling and one for walking;</p>	
	2. Number of protocols developed to guide implementation of EbA in San Salvador, Kingston and Xalapa.	<p><u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero</p>	At least one set of EbA protocols developed for each pilot city (three in total).	Protocols documents
	3. Number of water storage and management systems established through the project.	<p><u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero</p>	<p><u>El Salvador:</u> 30 water storage points h=1 metre. 10 rainwater harvesting systems for selected schools. 1 rainwater harvesting system for 1 selected community.</p> <p><u>Jamaica:</u> 3 detention ponds. 4 rainwater harvesting systems installed at schools.</p> <p><u>Mexico:</u> 1 artificial wetland at the Telesecundaria school Rafael Hernández Ochoa. 10 rainwater harvesting systems on the rooftops of 8 schools and 2 public buildings.</p>	<p>Field visits to verify the extent of the established water points. Interviews with local community members, including school representatives. Interviews with relevant implementing organisation at each project intervention site.</p>
	4. Number of waste management systems implemented in El Salvador through the project.	<p><u>El Salvador:</u> Zero</p>	<p><u>El Salvador:</u> 2 ecological sanitation systems at 2 schools to improve management of grey water and sewage.</p>	<p>Field visits to verify the extent of the implemented systems. Interviews with local community members, including school</p>

				representatives. Interviews with relevant implementing organisation at each project intervention site.
	5. Number of climate-resilient alternative livelihoods demonstrated at intervention sites through providing equipment, training and technical support.	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	<u>El Salvador</u> 10 urban gardens in 10 schools. 10 agricultural start-up kits at 10 schools in the Arenal-Monserrat area. <u>Jamaica:</u> 1 urban garden per school for 2 schools and 1 community garden. 400 fruit trees per school at 2 schools. 1 beekeeping unit in the community garden. <u>Mexico:</u> At least 10 food gardens to demonstrate potential climate-resilient livelihoods. 20 demonstration plots for commercial mushroom production 8 agricultural start-up kits at 8 schools.	Field visits to verify the extent of restored areas. Interviews with local community members, including school representatives. Interviews with relevant implementing organisation at each project intervention site.
	6. Number of people trained on implementing and maintaining the EbA interventions and climate resilient livelihoods.	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	<u>El Salvador:</u> At least 50 students (of which 50% women) per school for 10 schools will be trained on using agricultural start-up kits as well as development and maintenance of the urban gardens. <u>Jamaica:</u> At least 50 students (of which at least 50% women) per school from 4 schools will be trained on the development and maintenance of the	Attendance registers from training workshops. Interviews with local community members and students. Interviews with the project managers.

			<p>urban gardens. At least 40 people are trained on bee-keeping.</p> <p><u>Mexico:</u> At least 50 students (of which at least 50% women) per school from 10 schools will be trained on using agricultural start-up kits as well as development and maintenance of the urban gardens.</p>	
<p>Outcome 3: Knowledge and awareness of urban EbA interventions strengthened in El Salvador, Jamaica and Mexico, and throughout the LAC region.</p>	<p>1. Number of communication strategies for urban EbA developed.</p>	<p><u>El Salvador:</u> Zero <u>Jamaica:</u> One (national) <u>Mexico:</u> Zero</p>	<p>One communication strategy developed for each city (three in total) with specific guidelines for targeting different groups.</p>	<p>Communication strategy</p>
	<p>2. Number of communication tools²¹² developed and implemented – with specific focus on different groups (e.g. men, women, the youth, the elderly, persons with disabilities) – to increase awareness of government staff and urban communities on the benefits of EbA.</p>	<p><u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero</p>	<p>At least 15 tools developed in total.</p> <p><u>El Salvador:</u> At least 3 tools developed), at least 1 of which is focused specifically on women.</p> <p><u>Jamaica</u> At least 4 tools developed), at least 1 of which is focused specifically on women.</p> <p><u>Mexico:</u> At least 12 tools developed (including flyers, better practices manuals, short film signage, etc.), at least 1 of which is focused specifically on women.</p>	<p>Radio shows, webinars, posters, awareness campaign report.</p>

²¹² These communication tools include *inter alia* leaflets, posters, a radio programme, a tv advertisement and social media posts.

	3. Number of MSc research reports developed on the benefits of urban EbA with a particular focus on gender.	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	At least 6 reports, 3 of which include specific reference to gender-specific aspects of urban EbA. <u>El Salvador:</u> 2 reports <u>Jamaica:</u> 2 reports <u>Mexico:</u> 2 reports	Research reports.
	4. Number of educational toolkits ²¹³ – for primary and secondary schools – developed on best EbA practices	<u>El Salvador:</u> Zero <u>Jamaica:</u> Zero <u>Mexico:</u> Zero	At least 7 educational toolkits developed in total. <u>El Salvador:</u> 1 toolkit developed <u>Jamaica:</u> 2 toolkits developed <u>Mexico:</u> 4 toolkits developed	Existence of educational toolkits, attendance list of workshops, workshop reports, feedback from the ministry of education in each country.
	5. Number of knowledge-sharing products/events supported by the project to share lessons learned using existing regional and global networks.	Zero	At least three knowledge-sharing reports/events to share lessons learned through implementing EbA disseminated through regional networks (including REGATTA).	Knowledge-sharing reports and online webinars

²¹³ These toolkits will include a combination of lesson plans, small assignments and on-the-ground work.

Appendix 7: Work plan and timetable

Workplan key: Lead consultants for activities

Workplan key: lead consultant for each activity	Regional Coordinator	
	Regional Environmental Economics and Finance expert	
	Representatives of the MARN in San Salvador	
	Regional Socio-economic expert	
	Regional and National GIS experts	
	Regional Ecological expert	
	National Coordinators El Salvador, Jamaica and Mexico	
	National Agricultural expert El Salvador, Jamaica and Mexico	
	Regional Communication expert	
	National Website designer	
	National Academics	
	Regional Educational expert	
	Other (NCU/project staff)	

Activity	Annual breakdown				Quarterly breakdown																							
	Y 1	Y 2	Y 3	Y 4	Year 1				Year 2				Year 3				Year 4											
					Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4								
1.1.1																												
1.1.2																												
1.1.3																												
1.1.4																												
1.2.1																												
1.2.2																												
1.3.1																												
1.3.2																												
1.3.3																												
1.3.4																												
1.4.1																												
1.4.2																												
1.4.3																												
2.1.1																												
2.1.2																												
2.1.3																												
2.1.4																												
2.2.1																												
2.2.2																												
2.3.1																												
2.3.2																												
2.3.3																												
2.4.1																												

Activity	Annual breakdown				Quarterly breakdown																
					Year 1				Year 2				Year 3				Year 4				
	Y 1	Y 2	Y 3	Y 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	
2.4.2																					
2.4.3																					
3.1.1																					
3.1.2																					
3.2.1																					
3.2.2																					
3.3.1																					
3.3.2																					
3.3.3																					
3.3.4																					
3.4.1																					
3.4.2																					
3.4.3																					
3.5.1																					
3.5.2																					
3.5.3																					

Appendix 8: Key deliverables and benchmarks

See Appendix 3: Results Framework and Appendix 6: Costed M&E plan.

Appendix 9: Costed M&E plan

Type of M&E activity	Responsible Parties	Budget US\$ (Excluding project team staff time)	Time frame
Inception workshop and report	<ul style="list-style-type: none"> • NC (in country) • Regional Coordinator (RC) • M&E Specialist • CTA • UNEP TM 	Indicative cost: US\$6,000	Within the first two months of project start up. A regional inception workshop and launch will be held followed by a national workshop.
Baseline Study	<ul style="list-style-type: none"> • UNEP TM • CTA • M&E Specialist • NC (in country) • RC 	Indicative cost: US\$15,000	Within the first six – ten months of project start up.
Measurement of means of verification of project results	<ul style="list-style-type: none"> • UNEP TM • CTA • M&E Specialist • NC (in country) • RC 	To be finalised at Inception Workshop. This includes hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of means of verification for project progress on output and implementation	<ul style="list-style-type: none"> • UNEP TM • RC • NC (in country) • M&E Specialist • CTA 	To be determined as part of the AWP's preparation.	Annually prior to PIR and to the definition of annual work plans.
PIR	<ul style="list-style-type: none"> • NC (in country) • RC • CTA • M&E Specialist • UNEP TM • UNEP FMO (Fund Management Officer) 	None. Financial audit records to be provided for PSC review. Indicative cost: US\$5,000 per audit.	Annually

Type of M&E activity	Responsible Parties	Budget US\$ (Excluding project team staff time)	Time frame
Periodic status/ progress reports	<ul style="list-style-type: none"> • NC (in country) • RC • M&E Specialist • UNEP TM 	None	Quarterly
Independent mid-term evaluation/review (MTE/MTR)	<ul style="list-style-type: none"> • UNEP TM/UNEP Evaluation Office • NC (in country) • RC • CTA 	Indicative cost: US\$ 30,000	At the mid-point of project implementation.
Terminal Evaluation (TE)	<ul style="list-style-type: none"> • UNEP Evaluation Office 	Indicative cost: US\$ 60,000	At least three months before the end of project implementation.
Project terminal report	<ul style="list-style-type: none"> • NC (in country) • RC • M&E Specialist • UNEP FMO • UNEP TM 	Indicative cost: US\$ 6,000	On completion of the terminal evaluation.
Visits to pilot intervention sites	<ul style="list-style-type: none"> • UNEP TM • M&E Specialist • NC (in country) • RC • PSC representatives 	For GEF supported projects, paid from IA fees and operational budget	Annually
Consultants	<ul style="list-style-type: none"> • M&E Expert 	Indicative cost: US\$ 24,000	Over the lifetime of the project
TOTAL indicative cost Excluding project team staff time and UNEP staff and travel expenses			Estimated to cost US\$161,000

Appendix 10: Summary of reporting requirements and responsibilities

Reporting requirements	Due date	Responsibility
Inception Workshop Report	One month after Project Inception Workshop.	<ul style="list-style-type: none"> • M&E specialist • NC (in country) • RC • UNEP TM • CTA
Expenditure report accompanied by explanatory notes	Every three months.	<ul style="list-style-type: none"> • NC (in country) • Accountant
Cash Advance request and details of anticipated disbursements	When deemed necessary.	<ul style="list-style-type: none"> • NC (in country) • Accountant
Supervision Plan	Before the end of the project's inception phase.	<ul style="list-style-type: none"> • UNEP TM
Progress reporting	Quarterly.	<ul style="list-style-type: none"> • NC (in country) • RC • CTA • M&E specialist
Audited report for expenditures for year ending 31 December for Mexico	Yearly on or before 30 June.	<ul style="list-style-type: none"> • SEMARNAT and Municipality of Xalapa
Inventory of non-expendable equipment	Yearly on or before 31 January.	<ul style="list-style-type: none"> • NC (in country) • Accountant
Co-financing report	Yearly on or before 31 July.	<ul style="list-style-type: none"> • NC (in country)
PIR	Yearly	<ul style="list-style-type: none"> • NC (in country) • RC • M&E Expert • CTA • UNEP TM
Minutes of PSC meetings	Quarterly (or as relevant).	<ul style="list-style-type: none"> • NC (in country)
Completion report	Within six months of project completion date.	<ul style="list-style-type: none"> • NC (in country) • Implementing Agency
Final inventory of non-expendable equipment		<ul style="list-style-type: none"> • NC (in country)
Equipment transfer letter		<ul style="list-style-type: none"> • NC (in country)
Final expenditure statement	Within three months of project completion date.	<ul style="list-style-type: none"> • NC (in country) • UNEP TM
Mid-term evaluation/Review	Midway through project lifetime.	<ul style="list-style-type: none"> • NC (in country) • RC • UNEP TM • External Expert

Terminal evaluation	At least three months prior to the project end date.	<ul style="list-style-type: none"> • NC (in country) • RC • UNEP TM • External Expert
Final audited report for expenditures of project	Within three months prior to project completion date.	<ul style="list-style-type: none"> • AFO • UNEP FMO
Annual audit	Annually.	<ul style="list-style-type: none"> • NC (in country) • RC • UNEP FMO • External Expert/company

Appendix 11: Standard Terminal Evaluation TOR

Below are the standard Terminal Evaluation Terms of Reference (ToRs) of UNEP.

Objective and Scope of the Evaluation

The objective of the Terminal Evaluation is to: i) examine the extent and magnitude of any project impacts to date; and ii) determine the likelihood of future impacts. The evaluation will also assess project performance and the implementation of planned project activities and planned outputs against actual results.

Methods

This terminal evaluation will be conducted as an in-depth evaluation using a participatory approach whereby the UNEP TM, key representatives of the executing agencies and other relevant staff are kept informed and consulted throughout the evaluation. The expert will liaise with UNEP and the UNEP TM on any logistic and/or methodological issues that can compromise an independent review. The draft report will be circulated to UNEP TM, main representatives of the executing agencies and the UNEP. Any comments or responses to the draft report will be sent to UNEP for collation and the expert will be advised of any necessary or suggested revisions.

Key Evaluation Principles

In attempting to evaluate any outcomes and impacts of the project, evaluators must remember that the project's performance should be assessed by considering the difference between the answers to two simple questions "what happened?" and "what would have happened anyway?". These questions imply that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. In addition, it implies that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases, this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgments about project performance.

Appendix 12: Decision-making flowchart and organizational chart

See Section 4: Institutional Framework and Implementation Arrangements

Appendix 13: Terms of Reference

A 10.1 Project Steering Committee (PSC)

Background

The PSC will be responsible for undertaking management-related and technical decisions for the project in accordance with this ToR and providing guidance and direction for the project on a regular basis.

The PSC will review and approve the Annual Work Plans (AWPs) and reports as well oversee the M&E plan for the project. Additionally, it is required to authorise any substantive deviation from the agreed AWPs and budget lines. The PSC will also ensure that necessary resources are committed, and will arbitrate on any conflicts within the project or negotiate a solution to any problems between the project and external bodies. Lastly, the PSC will approve the responsibilities of the Regional Coordinator (RC). For detailed information on the responsibilities of the PSC, see Section 4.

The PSC will comprise the following members (see section 4 and 5):

- MARN;
- MWLECC;
- SEMARNAT;
- Focal points of the MOP, JSIF and the municipality of Xalapa;
- The Task Manager (TM), from the UNEP/GEF Climate Change Adaptation Unit;
- The Regional Coordinator who will play the role of Secretary for the PSC.
- The National Coordinators

Scope of Work

Specific responsibilities of the PSC are described below.

- Ensure that project objectives are fulfilled in an effective and efficient manner.
- Approve annual work plans and budgets, and other reports that may be required.
- Ensure effective quality assurance and financial reporting requirements.
- Ensure institutional coordination and facilitate an effective communication and decision-making process between government, implementation partners, civil society and other actors.
- Monitor and evaluate project implementation to ensure consistency with the approved work plans and results framework of the project.
- Review, revise and approve ToRs for staff, experts and contractors required to assist in project implementation, as proposed by the PM.
- Propose policy revisions that would facilitate the mainstreaming of the project activities.
- Facilitate interactions between the project management team particularly the PM and the relevant ministries or government agencies to optimise collaboration and sharing of experiences.
- Decide on deviations to original planning in technical or financial issues.

A 10.2 Regional Coordinator (RC)

Scope of Work

The RC will lead the project team and provide overall operational management for the successful execution and implementation of the project. This includes the daily responsibility to manage, coordinate and supervise the implementation of the project and the delivery of results in accordance with the project document and agreed work plans. Furthermore, the RC will be responsible for financial management and disbursements, with accountability to the government and UNEP. The RC will report to the PSC.

Particular responsibilities of the RC are listed below.

- Oversee and manage project implementation, monitor work progress, and ensure timely delivery of outputs.
- Supervise work of NCUs in each country.
- Report to the PSC regarding project progress.
- Prepare and submit project progress reports including Project Information Reports (PIRs) and others as required.
- Supervise coordination of activities of the Technical Advisory Committees in each country.
- Develop and facilitate implementation of a comprehensive monitoring and reporting system.
- Ensure timely preparation of detailed AWP and budgets for approval by PSC.
- Organise the PSC meetings.
- Assist in the identification, selection and recruitment of project staff and experts as required.
- Write ToRs for National Experts (NEs).
- Supervise, coordinate and facilitate the work of the Administration and Financial Officer, the in-country National Coordinators, the in-country finance consultants and the M&E specialist.
- Provide a quarterly update of the expenses of the previous three months and the expenses expected for the next three months to UNEP/GEF Climate Change Adaptation Unit.
- Establish linkages and networks with the ongoing activities of other government and non-government agencies.
- Provide input to management and technical reports and other documents as described in the M&E plan for the overall project. Reports should contain detailed assessments of progress in implementing activities, including reasons for delays, if any, and recommendations on necessary improvements.
- Participate in training activities, report writing and facilitation of expert activities that are relevant to his or her area of expertise.
- Inform the PSC immediately of any issue or risk which might jeopardise the success of the project.
- Provide on-the-ground information for UNEP-GEF/CCAU progress reports.
- Liaise and coordinate with UNEP TM on a regular basis.

Specific content related tasks:

- Develop the policy briefs under Output 1.1 in coordination with the policy experts in each of the three countries.

- Develop technical guidelines on planning, implementing EbA in urban areas developed for relevant government stakeholders, private sector and targeted communities under Output 1.2
- Develop training material and provide a training of trainer's workshop to local government authorities and the private sector on implementing urban EbA. This includes the development of training material in collaboration with an adaptation expert.
- Assist the national coordinators of the three countries to develop site-specific protocols for urban EbA and hold a workshop to discuss these protocols with the stakeholders.
- Assist the Regional Communication expert to develop and implement a communication strategy for each of the pilot cities as well as develop awareness-raising material.
- Collaborate with the website designer to develop an online portal or add to existing portals to share information on urban EbA.
- Collaborate with the National Academics in each of the countries to design and institutionalise a long-term research programme and appropriate MSc projects for students.
- Collaborate and provide technical input for the educational toolkits in collaboration with the Regional Educational expert.

Qualifications

- Master's degree in environment, natural resources management, agriculture or a closely related field.
- A minimum of 5 years relevant work experience including at least 3 years' experience as a lead project manager in relevant sectors.
- Demonstrated solid knowledge of ecosystem-based adaptation to climate change, ecological restoration and sustainable exploitation of natural resources.
- Experience in the public participation development process associated with environment and sustainable development is an asset.
- Experience in working and collaborating within governments is an asset as well as experience in GEF projects.
- Fluent in English and Spanish with excellent writing and verbal skills.

Reporting

The RC will work closely with the PSC and TM to ensure the availability of information on progress and performance regarding the implementation of the project. The RC will deliver progress reports on a monthly basis to the TM. These reports will include: i) status of activities; and ii) challenges encountered on the ground during project execution.

A 10.3 Administration and Financial Officer (AFO)

Scope of Work

The AFO will ensure that all financial and administrative issues are carried out according to UNEP standard procedures. He/she will make all the necessary administrative steps and financial transactions for project outputs and activities to be delivered according to the established workplan. The AFO will assist the RC and the TM in all project reporting requirements. The AFO will report to the RC.

Responsibilities

- Standardise the finance and accounting systems of the project while maintaining compatibility UNEP financial accounting procedures.
- Prepare revisions of the budget and assist in the preparation of the AWP.

- Comply and verify budget and accounting data by researching files, calculating costs and estimating anticipated expenditures from readily available information sources.
- Prepare status reports, progress reports and other financial reports.
- Process all types of payment requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cashbooks, vouchers, etc.) and reconciling data for recurring or financial reports and assist in preparation of annual procurement plans.
- Undertake project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of contracts and assurance of other eligible entitlements of the project personnel and experts by preparing annual recruitment plans.

Qualifications

- Master's degree in business administration, economics, development economics, finance, accounting or related fields.
- A minimum of 5 years relevant work experience including at least 2 years' experience in a multilateral organisation.
- Demonstrated solid knowledge of project reporting and budget preparation, implementation, monitoring and adjustment.
- Proven experience in working and collaborating with GEF projects.
- Experience in working and collaborating with governments and/or multilateral organisations.
- Knowledge of UNEP administrative and financial processes and procedures is an asset.
- Knowledge of UNEP financial system is an asset.
- Fluent in English and Spanish, including writing and verbal skills.

A 10.4 National Coordinator (NC) In-country

Scope of Work

A NC will be recruited in each of the three countries to lead execution of the local project activities and deliverables. This includes the daily responsibility to manage, coordinate and supervise the implementation of the project and the delivery of results in accordance with the project document and agreed work plans. Furthermore, the NC will be responsible for in-country financial management and disbursements, with accountability to the government and UNEP. The NC will work closely with national and local authorities, as well as NGOs, to manage effectively the project at local level. The PM will report to the RC.

Particular responsibilities of the NC are listed below.

- Oversee and manage project implementation, monitor work progress, and ensure timely delivery of outputs in target cities.
- Supervise work of the NCU in the respective country.
- Report to the RC regarding project progress. Reports should contain assessments of the progress of implementing activities, including reasons for delays, if any, and recommendations on necessary improvements.
- Act as a liaison and promote dialogue between national, provincial and local stakeholders.
- Coordinate activities of the Technical Advisory Committee in the respective target city.
- Promote the participation of local communities in project activities.

- Support the RC in developing and implementing a comprehensive monitoring and reporting system.
- Ensure timely preparation of detailed AWP and budgets for approval by the RC and the PSC.
- Organise the Technical Advisory Committee meetings.
- Supervise work of National Experts (NEs) and technical staff in the target cities.
- Assist in the identification, selection and recruitment of local project staff and experts as required.
- Supervise, coordinate and facilitate the work of the Finance Assistant.
- Provide a quarterly update of the expenses of the previous three months and the expenses expected for the next three months to the RC.
- Establish linkages and networks with the ongoing activities of other government and non-government agencies.
- Provide input to management and technical reports and other documents as described in the M&E plan for the overall project.
- Participate in training activities, report writing and facilitation of expert activities that are relevant to his or her area of expertise.
- Inform the RC immediately of any issue or risk which might jeopardise the success of the project.
- Provide on-the-ground information for progress reports.
- Liaise and coordinate with the RC and government authorities on a regular basis.
- Coordinate visits to project sites.

Qualifications

- Master's degree in environment, natural resources management, agriculture or a closely related field.
- A minimum of 5 years relevant work experience including at least 2 years' experience as a lead project manager in relevant sectors.
- Demonstrated solid knowledge of ecosystem-based adaptation to climate change, ecological restoration and sustainable use of natural resources.
- Experience in the public participation development process associated with environment and sustainable development is an asset.
- Proven experience in working and collaborating within governments.
- Experience with GEF projects is an asset.
- Fluent in English and Spanish (for El Salvador and Mexico) and fluent in English (for Jamaica) with excellent writing and verbal skills.

A 10.5 In-country Financial Assistant (FA)

Scope of Work

The FA will ensure that all in-country financial and administrative issues are carried out according to UNEP standard procedures. He/she will make all the necessary administrative steps and financial transactions for local project outputs and activities to be delivered according to the established work plan. The FA will liaise with the AFO regarding project transactions, procurement, payments and contracts as well as reporting requirements. The FA will work on a part-time basis and report to the NC and the AFO.

Responsibilities

- Ensure that the finance and accounting systems of the project are carried out according to UNEP financial accounting procedures, as defined by the AFO.
- Prepare revisions of the in-country budget and assist in the preparation of the local AWP.
- Comply and verify budget and accounting data by researching files, calculating costs and estimating anticipated expenditures from readily available information sources.
- Prepare status reports, progress reports and other financial reports.
- Process all types of payment requests for settlement purposes including quarterly advances to the partners upon joint review.
- Prepare periodic accounting records by recording receipts, disbursements (ledgers, cashbooks, vouchers, etc.) and reconciling data for recurring or financial reports and assist in preparation of annual procurement plans.
- Assist in undertaking project financial closure formalities including submission of terminal reports, transfer and disposal of equipment, processing of semi-final revisions, and support professional staff in preparing the terminal assessment reports.
- Assist in the timely issuance of local contracts and assurance of other eligible entitlements of the project personnel and experts by preparing annual recruitment plans.

Qualifications

- Bachelor's degree in business administration, economics, development economics, finance, accounting or related fields.
- A minimum of 3 years relevant work experience including at least 1 years' experience in a multilateral organisation.
- Demonstrated knowledge of project reporting and budget preparation, implementation, monitoring and adjustment.
- Proven experience in working and collaborating with GEF projects an asset.
- Experience in working and collaborating with governments and/or multilateral organisations.
- Knowledge of UNEP administrative and financial processes and procedures is an asset.
- Knowledge of UNEP financial system is an asset.
- Fluent in English and Spanish, including writing and verbal skills.

A 10.6 Terms of Reference of the M&E specialist*Scope of work*

The M&E specialist will be responsible for the monitoring and evaluation of all Outputs and activities in each of the three countries using the targets and indicators as outlined in the Results Framework (See Appendix 6). The NC in each country will report to the M&E specialist and inform him/her on a monthly basis on the project progress. The M&E specialist will visit each country once a year for annual reporting. The M&E specialist will work on a part-time basis.

Responsibilities

- Establishing a performance monitoring framework to define bi-annual targets for the project to meet the targets defined in the project document by the end of the implementation phase.
- Measuring the indicators at least 1–2 times per year to evaluate the progress of the project in meeting the targets and the application of gender-disaggregated indicators.

- Reporting to the NCU and PSC on the performance of the project according to project and AMAT indicators.
- Participate in the production of reports.

Qualifications

- At least a Bachelor degree in environmental management, ecosystem restoration, climate change adaptation or related field.
- A minimum of 5 years' experience in monitoring and evaluating technical projects related to climate change adaptation, ecosystem restoration or management of natural resources.
- Previous experience working in development country and with local communities.
- Experience working for international organisations and working in the LAC region would be an advantage.
- Good communication skills.
- Fluent in spoken and written English and Spanish.

A 10.7 General Terms of Reference for National Experts

Local expertise will be sourced where possible in place of international expertise in order to strengthen in-country capacity. National experts will be hired by the project to:

- Collect data.
- Provide advice relevant to their field and develop implementation protocols if required.
- Guide the implementation of the relevant project interventions.
- Monitor interventions.

In addition, the national experts must be experts in their field, ideally with experience in climate change adaptation, capacity building, and knowledge development. Additionally, they should have good knowledge and understanding of the climate change risks in the LAC region – both current and future –, an MSc. degree and a minimum of 5 years' experience or a bachelor's degree and 10 years' experience in their field of expertise. National experts need to be fluent in spoken and written English and Spanish to fulfil his/her tasks.

The hiring procedures to be followed for both international and national experts must include a transparent and competitive process based on normal UNEP procedures.

A 10.8 Terms of Reference for the in-country Technical Committee (TC)

Background

A Technical Committee will be established in each target city to promote dialogue between local stakeholders and implementing project partners. The TC will be responsible for discussing all information relevant to project implementation as it affects local communities. The group will be responsible for providing the members of the Project Steering Committee with the information needed to make informed decisions on implementation at the local level. The Technical Committee will convene regularly and at the latest one month prior to the scheduled meeting of the Project Steering Committee.

The Technical Committee will comprise the following members:

- Academics
- Local and national NGOs
- Local stakeholders and community representatives

- Representatives from local and national government authorities
- The in-country NC

Appendix 14: Co-financing commitment letters from project partners

Because of the size, these are attached as a separate Appendix.

Project Document

ng Tools

in excel file

Appendix 16: Draft procurement plan

National consultants	US\$/person month	Estimated person months	Tasks to be performed	Budget note
National Adaptation Expert (NAE) @ US\$3,000/month)	3,000	11	The national consultant with proven expertise in policy development and adaptation to climate change will undertake the following activities: i) develop training plans to improve local and national policy- and decision-makers' understanding of EbA. The training plans will be developed using international best practices and lessons learned from adaptation projects in the LAC region. The consultant will then implement the training plans and run training sessions and workshops with local and national policy- and decision-makers. ii) assist the Regional Coordinator with providing training on: i) the effects of climate change; ii) planning, implementing and monitoring urban EbA in each pilot city; and iii) the benefits of using EbA to adapt to the effects of climate change in urban areas. iii) refine the training material and assist the Regional Coordinator with providing a "training of trainers" programme for sub-national government.	2
Regional Expert in Environmental Economics/Financing expert	6,000	5	The regional expert with proven experience in environmental economics will identify and detail financing mechanisms for inclusion in the technical guidelines developed by the RC and adaptation expert. In addition, this expert will identify barriers to national dialogue on adaptation and mobilisation of funds for EbA implementation, and develop a strategy to overcome these barriers (Activity 1.4.1 and 1.4.2).	12
Regional Socio-economic Expert	5,000	13	This Socio-economic expert will: i) undertake assessments to identify the risks	16

			and adaptation needs of urban communities to the effects of climate change. (Activity 2.4.1 and 2.4.2); and ii) develop a community strategy and assist developing and implementing the additional climate-resilient livelihoods (Activity 2.4.1).	
Regional GIS expert	3,000	8	The regional expert will oversee the national GIS experts to collate data and produce digital maps (Activity 2.1.3 and 2.1.4).	17
National GIS expert	2,500	8	The NC will work closely with AGLCs, DREDDs, local communities and local community representatives to: i) collate spatial data on climate trajectories at the city level for San Salvador, Kingston and Xalapa. (Activity 2.1.3). ii) produce maps to show the worst-case scenarios related to urban development, climate-related risks and resource availability (Activity 2.1.4).	18
Regional Ecology Expert	5,000	4	The regional expert will collect and update data and information on biodiversity and ecology for the urban EbA intervention areas in San Salvador, Kingston and Xalapa. (Activity 2.2.1).	20
National Urban Planning Expert (NUPE)	5,000	1	The National expert will assist the other technical consultants in the implementation of the EbA interventions at urban landscape scale in each pilot city (Activity 2.3.1; 2.3.2 and 2.3.3).	24
National Agricultural Expert	3,000	22	The national expert will implement peri-urban EbA interventions related to sustainable agriculture in San Salvador, Kingston and Xalapa (Activity 2.4). This will include: i) designing and implementing sustainable agricultural practices to restore degraded ecosystems and ii) assisting with the development of urban agriculture gardens in each pilot city.	33
Regional Communication expert	5,000	15	The regional expert will draft a communication strategy and undertake local awareness raising activities on EbA using tailored communication	35

			material (Activity 3.1.1).	
Regional Education Expert	5,000	9	The regional expert will develop and pilot the educational toolkits in Activity 3.4.1 and 3.4.2 for primary and secondary schools in San Salvador, Kingston and Xalapa.	42
International consultants	US US\$/ person month	Estimated person weeks	Tasks to be performed	
Regional Coordinator	12,000	48	The Regional Coordinator (RC) will work closely with the NCs, national stakeholders and NGOs to: <ul style="list-style-type: none"> i) develop policy briefs, technical guidelines and strategies to upscale EbA (Activities 1.1.1 and 1.2.1 and 1.4.1); ii) provide training on technical guidelines to local government authorities in San Salvador, Kingston and Xalapa in cooperation with an adaptation expert (Activity 1.3.1) iii) assist with the development of the site-specific protocols for urban EbA implementation (Activity 2.1.1 and 2.2.1); iv) Collaborate with the communication expert on the communication strategy and awareness raising material (Activity 3.3.1 and 3.3.2); and v) Coordinate with national academics on the design and institutionalisation of a Long-term Research Programme on EbA (Activity 3.3.3). 	1
International M&E expert	6,000	4	The consultant will undertake the following M&E tasks: <ul style="list-style-type: none"> i) assist the socio-economic and ecological expert in developing site-specific protocols; ii) assist in the baseline assessment; iii) support in the mid-term evaluation; and iv) support in the final evaluation. 	2

Appendix 17: Site selection criteria and process

During the PIF phase, three cities in each country were proposed as pilot cities for urban EbA implementation. At the start of the PPG phase – during the regional inception workshop – the national consultants and national focal points were provided with a draft list of selection criteria and were requested to participate in an exercise to validate and rank the criteria for city and site selection. These selection criteria included: i) current and future vulnerability and threats to climate change; ii) willingness of local authorities to implement EbA; iii) social and demographic developments; iv) accessibility to the city; and v) availability of baseline and aligned projects.

After the regional workshop, a national inception workshop was held in each country to validate the city selection according to the selection criteria. As a preparation for the national inception workshop, stakeholder consultations with the executing agency were held and included an emphasis on proposed site selection criteria and considerations for implementation. For Mexico, three cities were proposed during the PIF phase. However, because of the presence of more medium-sized cities, national authorities proposed using a slightly different selection procedure. For example, the willingness of local authorities to implement EbA had a much higher priority by the national government in Mexico. As a result, during the national workshop a different city than one of those proposed in the PIF phase was selected. For more details on this selection, see inception report in Appendix 21.

San Salvador and Kingston were proposed as the most suitable pilot cities within El Salvador and Jamaica, respectively. Using their own selection criteria and ranking, SEMARNAT selected Xalapa as pilot city to implement urban EbA.

During the national inception workshop in El Salvador and Jamaica, three proposed intervention sites within San Salvador and Kingston were discussed. The proposed sites were selected by the national consultants based on the presence of an appropriate baseline project and their vulnerability to the effects of climate change. The stakeholders of the national workshop then selected one site based on the ranking of the selection criteria described above.

In San Salvador, the selected intervention site is the area of Arenal-Monserat. In addition to schools, two communities in the Arenal-Monserrat area are selected to participate. These communities are located high up in the watershed and the land use activities of these two communities have a large influence on the creation of landslides. Improving their activities will reduce the vulnerability of communities lower in the watershed to landslides. In addition, these communities do not have access to potable water. Assisting them with capturing rain water will increase their water availability for household consumption and for their gardens. As these two communities are quite small and isolated from the other communities, no problems are expected on why these two communities are selected to participate.

In Kingston, the intervention site is in and around the Tivoli gardens in downtown Kingston and includes four schools. In Xalapa, the intervention site is the area Fernando Gutierrez barrio.

Appendix 18: Environmental and Social Safeguards checklist

Please note that as part of the GEFs evolving Fiduciary Standards that Implementing Agencies have to meet is the need to address 'Environmental and Social Safeguards'.

To address this requirement UNEP-DGEF have developed this checklist with the following guidance:

1. Initially filled in during concept development to help guide in the identification of possible risks and activities that will need to be included in the project design.
2. A completed checklist should accompany the PIF
3. Check list reviewed during PPG phase and updated as required
4. Final check list submitted with Project Package clearly showing what activities are being undertaken to address issues identified

Project Title:	Building climate resilience of urban systems through Ecosystem-based Adaptation (EbA) in Latin America and the Caribbean.		
GEF project ID and UNEP ID/IMIS Number	GEF Agency Project ID: 5681 UNEP ID: 01238	Version of checklist	Two
Project status (preparation, implementation, MTE/MTR, TE)	Preparation	Date of this version:	June 2015
Checklist prepared by (Name, Title, and Institution)	Atifa Kassam, Task Manager, GEF Climate Change Unit, DEPI, UNEP		

In completing the checklist both short- and long-term impact shall be considered.

Section A: Project location:

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	Comment/explanation
- Is the project area in or close to -		
- densely populated area	Yes	San Salvador, Kingston and Xalapa are all in densely populated urban areas. The project aims to reduce vulnerability within these areas and hence there is no negative effect anticipated through the project.
- cultural heritage site	No	
- protected area	Yes	The intervention site in Xalapa is nearby the "Molinos de San Roque" Natural Protected Area.
- wetland	Yes	Within the project area in Kingston, there is one wetland, the project aims to restore areas within the wetland and hence there is no negative effects anticipated by the project.
- mangrove	No	
- estuarine	No	
- buffer zone of protected area	Yes	The Intervention site in Arenal-Monserrat in San Salvador is nearby "El Boqueron" Natural Protected Area. One of the EbA interventions implemented through the SCCF-Financed project will restore 150 hectares in the buffer zone of this protected area to reduce the risk of soil erosion and consequent landslides for the community living in Arenal-Monserrat.
- special area for protection of biodiversity	No	
- Will project require temporary or	Not	

permanent support facilities?	anticipated	
If the project is anticipated to impact any of the above areas an Environmental Survey will be needed to determine if the project is in conflict with the protection of the area or if it will cause significant disturbance to the area.		

Section B: Environmental impacts, i.e.

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	Comment/explanation
-Are ecosystems related to project fragile or degraded?	Yes	The ecosystems within the three cities are degraded as a result of waste pollution and unsustainable use of the natural resources. The objective of SCCF project is to restore these ecosystems and reduce their vulnerability to climate change.
- Will project cause any loss of precious ecology, ecological, and economic functions due to construction of infrastructure?	Not anticipated	
- Will project cause impairment of ecological opportunities?	Not anticipated	
- Will project cause increase in peak and flood flows? (including from temporary or permanent waste waters)	Not anticipated	The project will contribute to reduced risk of flooding through restoring wetlands and creating detention basins as water storage points.
- Will project cause air, soil or water pollution?	Not anticipated	The planting of trees within the urban area will reduce air pollution as trees filter the polluting particles. Similarly, improved solid waste systems will reduce pollution of urban waterways.
- Will project cause soil erosion and siltation?	Not anticipated	In El Salvador through the construction of ditches on the hills, water flow will be reduced and consequently the rate of soil erosion will be reduces. In addition, In Kingston, reforestation of the Hope watershed with drought-resilient species with deep root systems will hold the soil and consequently reduce erosion.
- Will project cause increased waste production?	Not anticipated	The project activities at household scale will address the increasing waste production through implementing ecological sanitation.
- Will project cause Hazardous Waste production?	Not anticipated	
- Will project cause threat to local ecosystems due to invasive species?	Not anticipated	For all planting activities, priority will be given to indigenous species that are resilient to the predicted climate change impacts. If it

		is not possible to plant indigenous species, an in depth study of invasion risk will be undertaken for each species that is considered for planting.
- Will project cause Greenhouse Gas Emissions?	Not anticipated	
- Other environmental issues, e.g. noise and traffic	Not anticipated	
<i>Only if it can be carefully justified that any negative impact from the project can be avoided or mitigated satisfactorily both in the short and long-term, can the project go ahead.</i>		

Section C: Social impacts

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	Comment/explanation
- Does the project respect internationally proclaimed human rights including dignity, cultural property and uniqueness and rights of indigenous people?	Yes	Consultations with different stakeholders have been undertaken over the course of the PPG phase and will continue during project implementation.
- Are property rights on resources such as land tenure recognized by the existing laws in affected countries?	Yes	The project is in line with the following laws that recognize rights on resources and land tenure: i) Environmental law and environmental policy in El Salvador; ii) the water sector Adaptation strategy and the Jamaican national Environmental Action plan in Jamaica; and iii) the general law on human settlement, the National Water law and the general law on Sustainable Forest Development in Mexico.
- Will the project cause social problems and conflicts related to land tenure and access to resources?	Not anticipated	During the PPG phase, consultations were conducted with the targeted urban communities and local authorities to ensure that all access rights and other issues are taken into account. This participatory consultation will continue during project implementation to avoid conflicts related to land tenure and access to resources.
- Does the project incorporate measures to allow affected stakeholders' information and consultation?	Yes	Stakeholders' vulnerability is a major criterion for the selection of project beneficiaries. During the PPG phase, the target urban communities were consulted through various workshops and one to one meetings. These consultations will continue during implementation. Please see Section 5 of the Prodoc for more details on stakeholder consultation. In addition, a Social Impact Assessment will be undertaken to establish a baseline.
- Will the project affect the state of the targeted country's institutional context?	Yes	The focus of Component 1 is strengthening the institutional and technical capacity of national and local government to assist urban communities in the implementation of EbA. This increased capacity, in combination with the development of technical guidelines and manuals, the revision of policies, strategies and plans and the development of an upscaling strategy, will promote the replication and maintenance of adaptation interventions to build climate-resilient livelihoods, based on an EbA approach. During implementation phase, the project will continue the process to review

		relevant policies and strategies and to use up-to-date climate information for the development and implementation of these policies and strategies.
- Will the project cause change to beneficial uses of land or resources? (incl. loss of downstream beneficial uses (water supply or fisheries)?	Not anticipated	The project is designed to enhance ecosystem services and access to resources. This includes increasing water infiltration and reducing erosion.
- Will the project cause technology or land use modification that may change present social and economic activities?	Not anticipated	The project will restore degraded watersheds and urban ecosystems such as wetlands and riparian forest. The proposed EbA interventions will take place where potential for modification and economic activities is minimal.
- Will the project cause dislocation or involuntary resettlement of people?	Not anticipated	No translocation of people is required for the project activities.
- Will the project cause uncontrolled in-migration (short- and long-term) with opening of roads to areas and possible overloading of social infrastructure?	Not anticipated	
- Will the project cause increased local or regional unemployment?	Not anticipated	The project will support the development of additional climate-resilient livelihoods and therefore contribute to increasing employment.
- Does the project include measures to avoid forced or child labour?	Not anticipated	The project follows the international labour laws. All required labour (short-term employment only) will be provided through community engagement and remunerated in accordance with national laws.
- Does the project include measures to ensure a safe and healthy working environment for workers employed as part of the project?	Yes	The project will conform to all national and international guidelines and laws regarding health and safety for workers employed as part of the project.
- Will the project cause impairment of recreational opportunities?	Not anticipated	The proposed EbA interventions will take place at schools and cemeteries where potential for modification and interference with current social and economic activities is minimal.
- Will the project cause impairment of indigenous people's livelihoods or belief systems?	Not anticipated	The project implementations will be undertaken after stakeholder consultation and in accordance with local belief systems. During the PPG phase, consultations were conducted in detail with the targeted urban communities and local authorities to assess their adaptation needs and tailor the EbA intervention accordingly. During the national workshops, input from local communities and authorities was asked to promote direct involvement in the project design and development. This participatory consultation will continue into project implementation phase to promote ownership of the EbA interventions and avoid future problems and conflicts.
- Will the project cause disproportionate impact to women or other disadvantaged or vulnerable groups?	Not anticipated	The project will aim to include equal representation of women and men in all project activities. Separate meetings were held with women groups in Jamaica to request their input and tailor the EbA interventions to their needs. As a result, more emphasis is placed on food production using fruit trees and the creation of a community garden.
- Will the project involve and or be complicit in the alteration, damage or removal of any	Not anticipated	

critical cultural heritage?		
- Does the project include measures to avoid corruption?	Yes	As per UNEP norms and standards the project will include regular financial monitoring and procurement will be done using UN rules and regulations.
<i>Only if it can be carefully justified that any negative impact from the project can be avoided or mitigated satisfactorily both in the short and long-term, can the project go ahead.</i>		

Section D: Other considerations

If negative impact is identified or anticipated the Comment/Explanation field needs to include: Project stage for addressing the issue; Responsibility for addressing the issue; Budget implications, and other comments.

	Yes/No/N.A.	Comment/explanation
- Does national regulation in affected country require EIA and/or ESIA for this type of activity?	Yes	Currently, according to consultations on the EbA interventions, in none of the three cities an EIA is required ²¹⁴ . However, at project inception phase rapid environmental assessments will be undertaken under Output 2.2. If any concerns arise, a full EIA will be undertaken.
- Is there national capacity to ensure a sound implementation of EIA and/or SIA requirements present in affected country?	Yes	There is capacity in country to undertake an EIA. However – as stated above – an EIA is not necessary to implement the planned EbA interventions in the three pilot cities.
- Is the project addressing issues, which are already addressed by other alternative approaches and projects?	To some extent	Consultations made during the PPG process show that some projects are already addressing the effects of climate change. However, they do not include using EbA in an urban context to address this problem and therefore the project will be the first to address this. The project will build on existing projects including government-funded and other NGO-funded activities and will provide opportunities for synergies.
- Will the project components generate or contribute to cumulative or long-term environmental or social impacts?	Yes	Through on-the-ground EbA activities and promoting climate-resilient livelihoods, the project will contribute to the long-term environmental and social impact. Training will be provided to target communities to implement and maintain the interventions after the project lifespan thereby contributing to the long-term environmental and social benefits of these interventions. In addition, through long-term research programmes, the effect of the EbA interventions will be monitored. This research will contribute to the long-term environmental impact of the project.
- Is it possible to isolate the impact from this project to monitor E&S impact?	Yes	Indicators were developed during the PPG phase to monitor the E&S effects of the project. Additional indicators will be developed if required during the baseline study to ensure comprehensive monitoring of the project's progress. Additionally, indicators to measure the long-term benefits of the interventions will be defined in the LTRP.

²¹⁴Overview of the EIA process and requirements in the LAC region are accessible online at: http://www.ifc.org/wps/wcm/connect/1069ce004c08ad23ae9cbe79803d5464/3_EIA+in+LAC+poster.pdf?MOD=AJPERES. Accessed 15 September 2015.

Appendix 19: UNEP comparative advantage

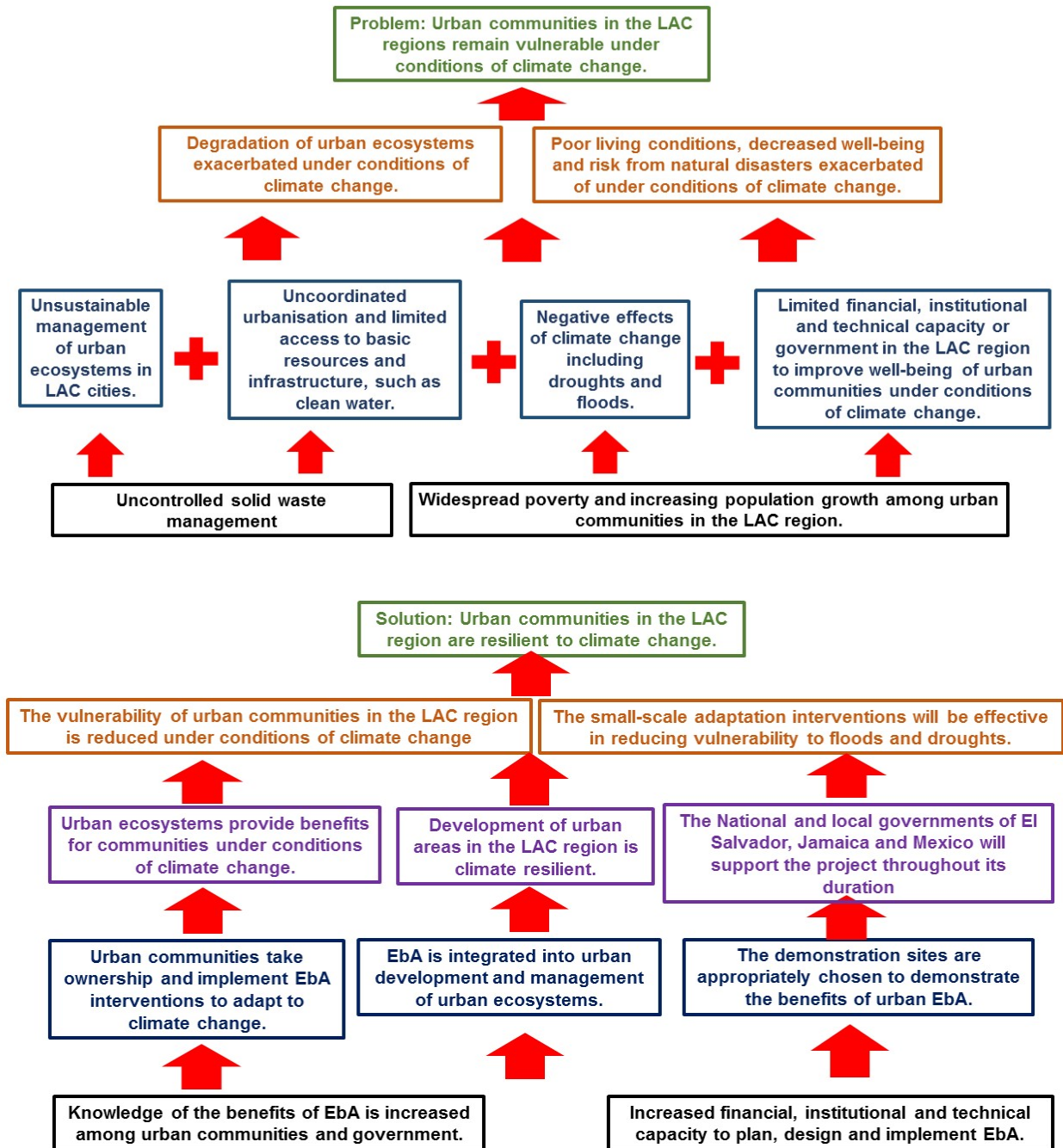
UNEP has considerable experience implementing climate change adaptation projects and providing scientific guidance in the field of climate change. To date, UNEP has implemented more than 90 adaptation projects (GEF and non-GEF) at global, regional and national levels. Through the implementation of those projects, UNEP works to develop innovative solutions for national governments and local communities to adapt, in an environmentally sound manner, to climate change. The SCCF project is therefore consistent with UNEP's comparative advantage in: i) demonstrating on-the-ground application of EbA; and ii) using the best available science and knowledge to inform decisions related to climate change adaptation.

The SCCF project will implement EbA interventions to increase the resilience of urban communities to climate change. UNEP has taken the lead in developing knowledge of ecosystems and adaptation technology, and therefore the SCCF project is in line with the UNEP's core business of providing technical advice on ecosystem management. The project will also benefit from UNEP's expertise and active network of local practitioners focused on municipal level environmental issues through on-going Geo Cities processes.

UNEP's Flagship Ecosystem-based Adaptation Programme represents a ground-breaking shift in focus in the realm of climate change adaptation, which has been commended by the Conference of the Parties to the UNFCCC (CoP). The EbA approach is multidisciplinary in nature, and involves managing ecosystems to build their resilience, and use ecosystem services to promote climate change adaptation and disaster risk management. This approach has been endorsed by GEF, IUCN and the EC, and will provide a platform to engage a broad range of stakeholders and sectors in the adaptation process. Through the SCCF project, UNEP will expand their core EbA portfolio into urban areas, demonstrating a new approach for increasing the climate resilience of cities and providing multiple societal and environmental benefits.

Through its regional office (ROLAC), UNEP has a long-standing engagement with many Latin American and Caribbean countries in helping them to address climate change impacts. This includes, *inter alia* i) the promotion of ecosystem restoration, poverty reduction and disaster risk reduction through the Haiti Regeneration Initiative; ii) ecosystem-based approaches for climate change adaptation in Caribbean Small Island Developing States; and iii) the development of risk and vulnerability assessment methodologies in Jamaica. UNEP's proven experience implementing adaptation projects in LAC region provides the foundation for the SCCF project.

Appendix 20: Theory of Change (Linkages between SCCF project Components, Outcomes and Outputs including related activities)



Appendix 21: Inception and validation workshops

Because of the size, these are attached as a separate Appendix.

Appendix 22: Execution arrangements with countries – letters of request

Because of the size these are attached as a separate Appendix.

Appendix 23: Letters of Endorsement from Countries

Because of the size these are attached as a separate Appendix.

ntability Framework

SE	UNEP DEPI RESPONSIBILITIES (as IA)	UNEP ROLAC RESPONSIBILITIES (As EA)
<p>and t, and</p>	<ul style="list-style-type: none"> • Ensure timely disbursement/sub-allotment to executing agency, based on agreed legal document and in accordance with UNEP and GEF fiduciary standards • Follow-up with Executing agency for progress, equipment, and financial reports • Provide consistent and regular oversight on project execution and conduct project supervisory missions as per Supervision Plans • Technically assess and oversee quality of project outputs, products and deliverables – including formal publications • Provide no-objection to main TORs/MOUs and subcontracts issued by the project, including selection of project manager or equivalent • Attend and facilitate inception workshops, and steering committee meetings. • Assess project risks, and monitor and enforce a risk management plan • Review of reporting, checking for consistency between execution activities and expenditures, ensuring that it respects GEF incrementality rules • Clearance of cash requests, and authorization of disbursements once reporting found to be complete • Approve budget revision, certify fund availability and transfer funds • Ensure that GEF and UNEP quality standards are applied consistently to all projects, including branding and safeguards • Certify project operational completion • Manage relations with the GEF 	<ul style="list-style-type: none"> • Ensure technical execution according to execution plan laid out in the project document • Ensure technical quality of products, outputs and deliverables • Ensure compilation and submission of progress, financial and audit reporting to IA • Submission of budget revisions to IA for approval • Addressing and rectifying any issues or inconsistencies raised by the IA • Bringing issues raised by or associated with clients to the IA for resolution • Facilitating Steering Committee meetings and other oversight bodies of the project • Day to day oversight of project execution • Submit all technical reports and completion reports to IA (realized outputs, inventories, verification of co-finance, terminal reporting, etc.) • Develop TORs for national consultants and submit to UNEP DEPI
	<ul style="list-style-type: none"> • Review and finalize PIR, develop portfolio level 	<ul style="list-style-type: none"> • Develop yearly project/programme implementation

PROJECT CYCLE PHASE	UNEP DEPI RESPONSIBILITIES (as IA)	UNEP ROLAC RESPONSIBILITIES (As EA)
	<ul style="list-style-type: none"> • The UNEP Evaluation Office ensures that independent evaluations (TE) are carried out according to GEF and UNEP requirements (dedicated budget, TOR, mission planning), and review evaluation reports. • Organize MTRs as a management tool and develop management response to MTR • Work with EA to develop management response to evaluation reports and Steering Committee recommendations. • Manage relations with the GEF Evaluation Office and GEF Secretariat on all M&E products • Ensure OFPs obtain all M&E products and respond to information requests 	<ul style="list-style-type: none"> • Facilitate MTRs as a management tool and develop management response to MTR • Participate in and provide all information requested by MTE and TE • Develop management response to evaluation reports and Steering Committee recommendations
Project financial closure	<ul style="list-style-type: none"> • Lead project closure process using information provided by EA. • Inform Trustee and GEFSEC of closure • Return any unspent GEF funds to Trustee • Conduct post-facto evaluations or lessons learnt exercises 	<ul style="list-style-type: none"> • Provides to IA information on financial closure. • Contributes to knowledge management exercises in relation to the project